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CONSERVATION OF OUR AGING POPULATION

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WASHINGTON, D. C.

At first blush it may seem a bit odd that a public servant at work in a Federal Security Agency program in the field of aging should have elected Conservation as the topic of his discussion. This area, it may reasonably occur, could better be left to the spokesmen of, say, our Department of the Interior. True enough, if we are content to confine the word within the comparatively narrow limits of the connotations given it through much usage. But are we?

Even those whose special interest is land conservation give the word its truer and broader meaning. As a matter of fact, I have taken my text from a prominent spokesman for our Department of the Interior—Mr. Marion Clawson, Director of the Department's Bureau of Land Management.

Conservation—a Definition

"Just what do we mean by conservation?" Mr. Clawson asked a graduating class at Billings, Montana, early this month. Then he proceded to answer his own question:

"Conservation means the maximum, continued use of resources both material and human. I believe that all parts of this definition are equally important. Maximum use is essential for the greatest productivity of our resources. Likewise, efficient use is necessary in order to achieve that maximum. By conservation we do not mean a feast today and a famine tomorrow, but a continued use of resources for the longest possible period."

What applies to land management applies with equal force to our management of that vast resource represented by the older group in our population. What is to be said of our claim to efficiency while the experience, special talents and acquired skills, and wisdom of millions of our seasoned men and women are all too commonly thrown aside, as though by the centrifugal force of a high-powered economy geared to youth and speed?

So far as I know, Mr. Clawson was not asked this question. Nevertheless, he gave the Montana students what seems to me a peculiarly satisfying answer to it.

"While conservation relates very largely to the use of material or physical resources such as land, and the resources above and below the earth, it can apply also to the use of **human** resources. When we are considering the use of physical and natural resources we are concerned primarily with how these resources contribute to human welfare. Thus defined, **conservation is an attitude of mind**, rather than a specific program of any kind. Conservation, in this sense of the word, involves **primary emphasis upon human values.** We are concerned with the **maximum well-being of the individual**, both now and in the future. We definitely do not want to lock up resources and withhold them from use, but on the contrary we want to make the **maximum** present **use** of them which is not incompatible with a continued use in the future."

Human Conservation

This, in its essence, is the problem of the conservation of an aging population. Its solution will be found through a cultivated "attitude of mind, rather than through a specific program." It calls, primarily, for emphasis upon human values. It is concerned with "the maximum well-being of the individual," and the maximum effective use of our population, of all age groups.

It is not necessary for the purpose of this discussion to spend time in a statistical analysis of the aging problem. I am happy to report, that awareness of these statistics and their significance is spreading throughout the country. Community activities, new university extension courses, conferences, institutes, and new research projects—all are reflecting public recognition of problems implicit in the fact that the age level of the people of the United States has been rising

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at a rate which indicates that by 1975 some 13 per cent of our total population may be 65 years of age or older; and that while this has been going on, our highly industrialized economy has been throwing a larger and larger proportion of these older people into disuse.

The country at large is beginning to see that here is an anomaly packed with trouble, if not peril. Communist aggression has forced us to superimpose an expanded defense program upon a booming civilian economy. We have undertaken a limited mobilization of our resources for defense. Conservation in its broadest sense has become vitally important. Somehow, we must find ways by which "to make the maximum present use of our human resources which is not incompatible with a continued use in the future."

Instead of discarding older workers, we must discard the outworn and now dangerous idea of chronologic age as a measure of capacity and potential productiveness. I believe that by working in this direction we shall soonest arrive at sound ways of dealing with both the utilitarian and humanitarian aspects of the problems of an aging population. I believe, too, that we shall then find that the humanitarian and utilitarian factors are inseparable, the one dependent upon the other; and that eventually we shall come to accept, as a principle of our free society, that the community must make a primary concern of the security, productiveness, and well-being of the individuals who make it up. That will be conservation.

Needs of the Aging

We are still somewhat short of unanimity as to whether and to what extent productiveness is an essential of the later years. Looking back over the deliberations of the Conference on Aging last summer, I believe that the greatest heat was generated over the question of the role of the older person in the productive economy. The question of employment was debated in at least half of the sections.

The divergent points of view may be summarized as follows: One group includes those who believe that older people do not have the capacity for continued productive work; that their services are not needed; that they have made their contribution and are entitled to rest; that pensions representing some fraction of their former earnings will allow them to meet their simplified needs and to live in contentment. On the other side are those who see older people as wanting to continue in useful roles; as able, by and large, to continue in productive employment; as persons whose services are actually needed during the period of mobilization at least; as being too expensive to maintain in retirement. This group does not accept the contention that human needs are simplified with accumulation of years.

My own view, and that of most Conference participants, conforms more closely to the second of these two positions. The more I learn of this subject of aging, the more I become convinced that the fundamental need of aging people—perhaps the essence of the whole problem—is their desire to continue as full-fledged members of the community.

Older people have the same need to be wanted that all of us have. They have a compelling desire to feel useful, to be appreciated, to be recognized for their importance —in short, to be a necessary part of things. In addition, they desire the love and companship found in family relationships and close friendships. Finally, they need self-respect that comes from independence, both financially and in terms of self-management.

Conversely, I think perhaps the greatest fear older people have is that of being set aside as useless, financially dependent, and unwanted. We need a great deal of research in the aging field but we don't need to have this point proved. There is evidence in the fact that nearly three million older people are still employed, that most of those who retire do so involuntarily.

There is evidence from all who have interviewed older people who have retired (or are faced with retirement) from gainful employment or from homemaking. These interviews turn up instance after instance of hunger for something to do and of great loneliness from lack of family and social contacts.

There is evidence from older people who are being brought into panel discussions. The ones who are enjoying life are the ones who are busy, who have recognition for what they are doing, who have human companionship. All insist upon the importance of having the means to participate and the opportunity for self-expression.

A Cultural Lag

Meeting the needs of older people is not an easy task. For one thing, their needs cover nearly the whole range of human activities. In addition, older people are individuals, and their interests and circumstances are infinite in variety. The situation, as I see it, however, is that the older people of 1951 are living in a culture that was not built for them, that has moved away from the roles we have assigned them.

In the hand economy of earlier years—primarily agricultural—the sense of usefulness was derived from having a positive role in the productive family group. Most people lived through the reproductive period and then died. Relatively few lived beyond middle life and these, apparently, had little difficulty in finding useful activity.

The transition to mechanical production and the use of power has tended to freeze older people out. The number of older workers employed has increased, but the proportion in gainful employment dropped by almost one-half between 1890 and 1940.

Family life has changed, too. Most workers earn their living outside the home and have no economic need for the older generation in the home. Indeed, many young people leave the community of their parents. The social interests of the young also tend to be focused outside of the home and do not include grandparents. Standards for children are higher, producing greater competition for family income. Families are smaller and parents are living longer, thus placing a greater burden on the fewer children who do try to care for their parents.

Briefly, we are confronted with a cultural lag. Technology and changing family life are leaving older people stranded. The job before us is plainly one of re-incorporating aging people into the total life of the community.

Society must invent ways of meeting the needs of aging people so that they not only feel but are a part of the social system. It is not entirely a task of social and welfare work, although that is a part of it. It is not merely doing for older people, though some require that. It is actually a question of conserving their potentialities—creating an environment in which they can employ their skills, experience, and wisdom in making continuing contributions, not for themselves alone but for all of us. It is the job of substituting a contributory status for one of dependency.

And, I repeat, it appears to be a job for the community and not just for the individual families that happen to have older people in them. If we accept the analysis I have tried to make, we recognize that the shift is away from family responsibility to community responsibility.

The Neglected Resource

Two groups of our aging population call for special consideration in any examination of the requirements of human resource conservation. The one is comprised of men and women from about 35 to 65, who are in the earlier stages of the aging process. There are sizeable numbers in this group who are barred from employment by age barriers. The other group is comprised of men and women aged 65 and over.

This analysis will be limited to the conservation area represented by the second group. Basing our calculations on Bureau of Census data for 1950, we may estimate the present number of persons in this group at nearly 13 million. At one extreme are those —about a quarter of the total—who are gainfully employed. At the other extreme are perhaps from one to two million who are too infirm or too ill to work any more, and who need and deserve adequate care and the greatest possible measure of comfort. Between these two extremes lies a resource whose vast potential is a present and insistent call for conservation. In this group are millions of men and women who are either physically and mentally fit and eager to work; or who can be rehabilitated for work; or for whom activities which will serve as substitutes for direct participation in the work force can be devised.

Some Conservation Experiments

Many experiments are going on in various places across the country designed to utilize the capacities of this middle group. We do not yet know how successful they are.

Some business and industrial establishments are retaining or bringing older workers in for full- or part-time work. Some older people are finding their own solutions in paid work, in avocational pursuits that afford satisfying recognition, or in voluntary community activities.

Efforts are being made in several places to find new activities for older people. I

believe that the civil defense program offers opportunity for older people, as it did during the last war. The Red Cross has utilized older women in a variety of useful ways. The British used women as radar watchers. Without waiting for actual war, we can steer older women into shortage occupations such as practical nursing, clerical and sales work, operators of foster and boarding homes, and probably many other occupations that do not require years of training and experience.

Day centers for older people and golden age clubs represent another device for satisfying varied needs. In New York, Cleveland, and elsewhere these centers have workshops for handicrafts; facilities for learning to draw and paint and to play musical instruments; discussion groups, dramatics, club newspapers, social gatherings, and committees for visiting the sick.

In addition to actual activity, these centers provide older people an opportunity for creative self-expression, for recognition of their accomplishments, for making new friends, and for getting their minds off themselves. Who is to say that persons who develop handicraft skills are not making positive contributions to American culture?

The Hodson Center in New York is the oldest one. During the eight years of its existence, it has attracted more than 400 people. Mental health statisticians say that 40 out of a population of this size in this age group over a comparable period would be expected to become candidates for admission to a mental hospital. Not one has! Think of the human misery that has been spared, the mental discomfort of families, and the saving in costs of providing hospital beds! Every retired older person who cares for his own health needs and mental well-being is making a social contribution.

I cannot refrain from pointing out that the public funds for these New York day centers and in Minneapolis, too, are provided by the welfare department. The assumption is that the expenditures will be more than offset in savings in the time of welfare workers, physicians, and hospital staffs.

Alertness to current social issues and intelligent action with reference to them represents another area of positive social participation. Adult education programs are being revised in some places to present stronger appeals to older people. Discussion groups and forums are being organized; library facilities extended.

These are a few of the projects that are being developed. We know very little about them yet, how and where they can best be organized, the extent to which they satisfy needs. The entire area represents a fruitful and important field for experiment.

"Manpower"—What Is It?

In conclusion, I want to suggest a speculation which has been taking no small part in my own recent thinking about the nation's human resources in general, and about the reservoir represented by the older group in particular. What is the potential? What are the values, quantitative and qualitative, to be realized through conservation of our older people? Who knows? Nobody. The answer lies beyond any human calculation.

"Manpower mobilization" is a term that has come into popular use since our national defense program got under way. It has become so familiar that we use it almost as though manpower were a ponderable, to be measured, weighed, or its quantity calculated, like so much tin, oil, or foodstuffs. If that were so, of course, there would have to be a unit of manpower. Is there one? What is it? Webster defines it as "one-tenth of a horse-power."

Anyone who has been much around horses knows that you can get a lot more work out of a happy horse than you can out of an unhappy one. I recall how a well known dairy used to advertise the superior quality of milk from "contented cows." Surely the human race is justified in thinking that the variable of its imponderable, intangible potential is infinitely greater than that of the lower creatures of the earth. By the same token, not one of us would seriously question the obvious: that there is something over and above numerical strength to be figured into a manpower potential. It has shown itself, over and over again, in our growth as a nation. It has never been measured. It is the might of the spirit. It has become the hope of the world.

And with reason. Not quite ten years have passed since the day when, with the bulk of the American fleet at anchor in Pearl Harbor, eight battleships and ten other warships were sunk or damaged, and an enemy who had struck without warning or provocation was beginning the swift outflinging of

his armed aggression. All of us remember, and so does most of the rest of the world, how at the time of that outrage our industrial system was only in process of conversion to defense production; how manpower mobilization in a defense program was still in its fluid stages; how the American people were first stunned, then aroused; how, united, we braced, and went on to win. Great contributions were made by our older workers. It is too bad more detailed records of their performance were not kept for reference now. To them must go a large share of the credit when "the impossible" became history; when production goals which hardheaded experts had derided as "fantastic" were reached and passed, when we spoke of "miracles" and won the war with them.

That was Conservation, with a big "C." It was a people's effort, unified and coordinated, to put "primary emphasis on human values"; to "make maximum present use" of human resources which was "not incompatible with a continued use in the future." The pity of it is that, once the war was won, we permitted such high-level efficiency to sag.

As we entered and passed through those critical days of a decade ago, we found that our human resources were greater than we had known. They are still greater than we know. Can anyone, looking back, find reasonable ground for dispute with those who say that we have hardly begun to explore the possibilities of human achievement? For the third time in a lifetime, it has fallen to us to give proof to friends and enemies alike that American capacity to endure and to do, surpassingly, draws its life through a taproot sunk into the deep wells of the American ideal; the American concept of human rights divinely established, and so inseparable from the individual.

The Challenge

And not only under the impulsions of war or threat of attack. There, as I see it, lies the challenge to us all, as we seek together for solutions of the problems of aging. Looming larger and larger is the need for a shift in national outlook and a concert of endeavor to discover and develop ways by which to give greater opportunity for full enjoyment of individual liberties; full play to the capacities of all our people, for the good of all, at all times. Only so, it seems to me, can we establish true democracy in an aging population. Only so can we build a truly sound economy and attain an enduring prosperity.

Only so, I submit, can we advance toward genuine conservation of our human resources. We are all people and we are all, each one of us, right now, aging. What we do for the good of our older people, now, we shall be doing for each one of us at some future day. We shall be doing it for the good of generations to come, the members of which, one day, and in mounting numbers, will make up the older group.

Our aging men and women of today have made contributions. All but a few have much still to give. True conservation demands that we remember always that they are human beings—whole human beings. They are our countrymen—whole citizens. They are entitled to whole citizenship. They are entitled to enjoy the fruits of the experience, skills, and wisdom that have come to them through the years. If we who are younger, deny them this, we shall be denying not only ourselves but those who come after us. We need what our older people have to give. It is ready to hand for our use. I, for one, am for any measure in line with our tradition that will mean the end of waste too long ignored; the opening of full opportunity where it has been too long denied. I am for maximum utilization of our older people. I am for conservation of our aging population.

It is in the area of chronic disease that physical medicine and rehabilitation holds great implications for internal medicine, for probably three-quarters of the time of the average internist is spent on patients with chronic illness. The problems of acute, communicable disease that commanded our major attention a few decades ago have been replaced by the problems of chronic illness. Ironically, it was the outstanding achievements of the past three decades that created our present problems: what to do with chronic disease and disability in our aging population.—Rusk, H. A.: Chronic Diseases in an Aging Population, Ann. Int. Med. 33:1341 (Dec.) 1950.

Chronic diseases in various forms — whether poliomyelitis, tuberculosis, cardiovascular disease, diabetes or any of the other abnormalities that are likely to alter a patient's social and economic activities—account for three fourths of all illness today. Progressive control of infectious diseases and the increasing number of elderly people in the population are bringing about a situation in which the chronic illnesses and preventive medicine may in the future demand the entire attention of physicians. Editorial, New England J. Med., August 10, 1950.

CARBON DIOXIDE THERAPY

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DURHAM

This is a preliminary report of 35 patients who received the so-called carbon dioxide treatment, consisting of 30 per cent carbon dioxide and 70 per cent oxygen inhalations, at Duke Hospital since January, 1951.

Treatment using various mixtures of carbon dioxide and oxygen is not new. This form of treatment by inhalation was introduced into psychiatry by Loevenhart, Lorenz, and Waters in 1926, and was used in the treatment of psychotic patients, particularly those with catatonic schizophrenia. The idea was that if no structural change in the brain existed, the disorder must be one of function, and that this disorder of function might be altered by biochemical or physiologic means.

Meduna[1] became interested in this work, but came to the conclusion that in psychotics a profound alteration occurred that was only temporarily benefited by the carbon dioxide-oxygen inhalations. In 1943 he began to use this type of treatment in psychoneurotic patients and found that 68 per cent were apparently cured or improved. He formulated a neurophysiologic theory of psychoneurosis[2] which, in essence, is that if the human organism constantly attempts to attain homeostasis and fails, reverberating circuits are set up within the nervous system, producing the psychoneurotic symptoms. He believed that the repeated administration of carbon dioxide cured these psychoneurotic conditions by permanently increasing the threshold of stimulation in the reverberating circuits and thus achieving homeostasis by turning positive feed-back circuits into negative feed-back circuits.

Classification of Cases

For purposes of clarification and evaluation, we have adopted the classification of psychoneurotic disorders used by Meduna:

1. Sympathetic reactions (involving frank symptoms of anxiety).

2. Parasympathetic reactions, including cardiospasm, spastic colitis, gastric ulcer, female frigidity, and male impotence.

3. Motor reactions, such as habit spasms, tics, stuttering, and, in general, a hyperfunction or disfunction of the striated muscles.

4. Ideomotor reactions, in which behavior is directly related to a thought process, such as homosexuality, phobic states, alcoholism associated with feelings of inferiority or other anxieties, conversion hysteria, and profound invalid patterns.

Results

Sympathetic reactions

In the first group, the sympathetic or anxiety reactions, we had 8 patients. None of these patients is regarded as recovered clinically, but all report subjective improvement. A rather typical remark is: "I feel jittery for a few minutes (perhaps fifteen minutes), and then when that goes away I feel relaxed and don't worry anymore."

In this group was included one patient with *petit mal*. Following an illness of "black measles and pneumonia," this 16 year old white girl had had from thirty to sixty *petit mal* seizures a day from the age of 7 years, unchanged by any type of medication. It was believed that psychogenic factors contributed to the number of spells, and carbon dioxide treatment was begun. Throughout the course of treatment all anti-epileptic medication was removed, and after the thirty-fifth treatment the spells occurred on an average of twelve to fifteen a day. More noticeable to the patient, family, and friends was the shorter duration of these spells—"only momentary"; and occasionally the patient could tell when she was about to have a spell, could shake herself, and it would not occur.

Parasympathetic reactions

We had 4 patients with parasympathetic reactions. The striking improvement in 3 of these cases warrants description. A 25 year old white woman with frigidity and marked dyspareunia threatened divorce because of her distaste for sex. After the tenth treatment she was able to have orgasm and enjoy normal sex relations. Two patients had an allergic type of skin reaction that was relieved only temporarily by antihistamine. At last report they were completely relieved by carbon dioxide-oxygen treatment. The fourth, a patient with asthma still under treatment, reports, "I am 50 per cent better than when I started treatment and don't go all to pieces when I know I am going to have

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an attack." Clinically, this patient has as many attacks as before treatment, but they are less incapacitating.

Motor reactions

There were 6 patients in the third group. One patient with "writer's cramp" of eight years' duration stated that before treatment he was easily fatigued. After thirty-three treatments he was aware of a tenseness, "like nervousness on the surface," but felt that it was under control. He was able to continue writing throughout a very hard day, and was able to relieve the tightness in his hand by flexing the finger muscles.

Four other patients are stutterers. Clinically no improvement is manifest, although all state that they feel less tense. One, a graduate student who had had considerable speech training, felt himself going backward this year until he started carbon dioxide-oxygen treatment. Another mentioned that a friend and his mother thought he spoke much more easily, but he himself could see no change after twenty-eight treatments. The other patient, a 36 year old white woman with torticollis had seven treatments. Although "delighted at her improvement (relief of pain, relaxation of severe spasm, and ability to use her arms to feed herself for the first time in four months), she decided to go home to Florida, partly because of financial reasons, but mostly because she was "homesick."

Ideomotor reactions

The fourth group is composed of a wide range of psychoneurotic conditions. A 26 year old married woman, an "expensive" invalid for five years, now after forty-five treatments is functioning more effectively than at any time before in her life. She is more stable emotionally, and, although she still has many of her original complaints, she is not greatly concerned about them. She has been able to assume her household duties, create other interests, learn to drive the car, and even make screens for the windows of her home.

A man of 32 came for examination following civil difficulties due to alcoholism. He had been the "biggest drunk of 1,800 men in college," and, although he had had eight months of psychotherapy two years ago, had not modified his pattern in any way. After thirty-four treatments he stated: "The compulsion to drink is gone." He has not been on a drunk in four months, the longest period of abstinence in fifteen years, but does have a beer or so with friends quite naturally and without the feeling of limiting himself. This same man, a writer, had been unproductive for eighteen months before coming for treatment. He had many phobias, and was anxious, tense, and depressed. While under treatment he felt "relief," began to write, and recently had an article accepted by a leading literary magazine.

Of the 12 cases in this group of ideomotor reactions, 8 patients were objectively and subjectively improved. Three showed no improvement. The other patient was a woman of 40, hysterically blind for eight years, who received a pension on the basis of her blindness. She came to the hospital with the chief complaint of shooting pains in all her extremities (of some fourteen years' duration), stiffness and pain in all her joints, with increasing limitation of motion of some six months' duration. She was practically bedridden on admission. After the fourth carbon dioxide-oxygen treatment she reported considerable improvement and stated that she could distinguish shadowy figures. At the time of her discharge from the hospital after sixteen treatments she had gained in weight and strength, her vision had returned, and she was able to walk back to the ward unassisted. A fourth year medical student followed this patient in psychotherapeutic interviews throughout her hospital stay and at one to two week intervals after her discharge. He reported that she held the gain made in the hospital.

Severe depressions

Although Meduna, as had Loevenhart, Lorenz, and Waters, found that carbon dioxide-oxygen inhalations were of no lasting benefit in psychotic patients, five patients recognized as severely depressed were given a trial of carbon dioxide-oxygen. Several factors were elicited in the study of these patients that proved helpful in treating others whose symptoms were associated with some depression, but none of these five patients were benefited by the carbon dioxide-oxygen treatments.

Method of Administration

The treatments are easy to administer. A tank of the gas mixture made commercially costs about $10.00, and is sufficient for about 100 treatments. A flow-meter and a mask

regularly used for the administration of anesthesia are the only other equipment required. The treatments are short, the total time varying from five to ten minutes unless combined with psychotherapy, which is not necessary in the average case. Meduna reports no contraindications to the treatment[3], but I would be reluctant to administer the gas mixture to patients with severe cardiac or pulmonary disorders. Some caution should be exercised in the administration of the gas not to increase the distress of the depressed or anxious patient. The same might be said of the aggressive patient who is apt to have, early in the course of treatment, a violent motor reaction.

Reports from Jackman and Shorr show long lasting results[4], and Meduna reports no relapse in some patients after a five year period. Our own period of working with the gas is too short to venture an opinion on this point, although several patients report improvement even after carbon dioxide-oxygen treatment is discontinued. "I can handle things better now."

None of our cases have had over fifty treatments, but 150 treatments on one patient have been reported. The criteria used is the continued improvement as felt by the patient. The number of inhalations varies with the patient, from twenty to forty on the average, although seventy and even ninety have been used at one treatment without ill effect.

Summary

Thirty-five patients were given carbon dioxide-oxygen inhalation. Five had recognized depression, and were not benefited. Among the 30 psychoneurotic patients, no cures can be reported at this time, although 3 patients believe themselves to be cured. Twenty-three patients were improved, and 4 patients were not benefited.

Carbon dioxide - oxygen inhalations are easy to administer, safe, inexpensive, and in our small series were effective in 86 per cent of the cases.

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Discussion

Dr. F. G. Hall (Durham): Dr. Silver has made careful observations. It would be interesting to know if psychiatrists employing this therapy have influenced the patient by "non-directive psychotherapy" or other psychologic procedures used with the carbon dioxide therapy. Dr. Silver has probably kept this possibility in mind, for his report shows a critical examination of all his cases. He is wise in not administering high carbon dioxide mixtures to patients with severe cardiac and pulmonary disorders.

My general impression of Meduna's thesis for the rationale of carbon dioxide therapy is that it is veiled in many symbolic explanations. We certainly do not have a clear cut physiologic or biochemical explanation of the mechanism by which this therapy is effective. However, this does not mean that there may not be one.

SUBACUTE BACTERIAL ENDOCARDITIS

*Clinical and Bacteriologic Correlation in a Stubborn Case Cured with Massive Chemotherapy**

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The management of patients with serious infections often becomes extremely difficult when the organism involved has been exposed to prior chemotherapy. If the growth of the etiologic agent is suppressed by treatment, the diagnosis may be obscured; and if the organisms have lost their susceptibility to the most potent antibiotic agents, therapy may be difficult to design.

When an organism loses its susceptibility to a drug it is usually because relative drug-fastness has developed in the strain as the result of exposure to repeated short courses or inadequate doses of the drug. Treatment with small doses of a chemotherapeutic agent over short periods of time is frequently given for relatively minor complaints, usually in the upper respiratory tract, and most often of a recurring nature.

The problem of drug-fastness is especially important in the management of subacute bacterial endocarditis. Because this condition so frequently develops following upper respi-

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*The aureomycin and the greater part of the penicillin used in this study were supplied by Lederle Laboratories Division, American Cyanamid Co., Pearl River, New York.

ratory infections, and particularly after manipulation of the teeth, the physician in charge of a patient with a known heart lesion will have to use keen judgment in deciding whether or not prophylactic chemotherapy should be given for a minor illness.

The following case is reported because it illustrates so many points which are fundamental in the treatment of infections.

Report of a Case

A 30 year old traveling saleswoman, the divorced mother of two children, was first admitted to the North Carolina Baptist Hospital on March 18, 1949. Her general health had been excellent until five months before admission, when she began to have pain and tenderness in the left ankle and knee joints. These symptoms, which were aggravated by motion and associated with some redness of the joints, persisted for one week. No chills or recognized fever accompanied them. She was then asymptomatic until four months prior to admission, when she began to tire easily, and noted general malaise, apathy, and weakness. These symptoms were associated with low grade afternoon temperature and sporadic, severe frontal headaches.

She stopped work, and one month prior to admission consulted her family physician. He found her temperature to be 102 F., and gave her several injections of penicillin. Her symptoms improved temporarily, but during the three weeks prior to admission she had several more sporadic episodes of fever with temperature to 103 F. associated with general arthralgia, and malaise. There were no chills, but each bout of fever was accompanied by drenching night sweats. Penicillin injections were given for each episode of fever, and produced temporary improvement. The progressive course of the disease was not altered, however, and after a month of intermittent therapy with penicillin she was admitted to the North Carolina Baptist Hospital. She had lost approximately 25 pounds in weight during the course of her present illness.

There were no symptoms referable to the cardiovascular, respiratory, gastrointestinal or genitourinary systems. The past history revealed no symptoms of rheumatic fever or chorea. For ten years prior to her present illness she had had frontal and maxillary sinusitis, usually worse in the late winter and spring months. There were also frequent upper respiratory infections and sore throats, but no history of an operation or dental extraction preceding the present illness. The family and marital histories were non-contributory.

Physical examination

The temperature was 102 F., the pulse 104, blood pressure 100 systolic and 60 diastolic, weight 145 pounds. The patient was well developed, well nourished, and in no acute distress; but she appeared chronically ill. No lesions or hemorrhagic phenomena were seen in the skin. The nasal septum was deviated to the left, and the mucous membranes were pale and boggy. Oral hygiene was excellent. The heart was normal to percussion, and had a regular sinus rhythm. Over the apex there was heard a loud, harsh, blowing systolic murmur which was transmitted to the axilla and along the left sternal border. This was preceded by a loud first sound. The second pulmonic sound was louder than the second aortic sound and was snapping in character. There was no diastolic murmur, or palpable thrill. The liver and spleen were not palpated. There was no clubbing of fingers or toes. No venous engorgement and no pedal edema were present.

Accessory clinical findings

The hemoglobin was 10.4 Gm., the red cell count 3,500,000, and the white cell count 8,100 with 72 per cent segmented and 11 per cent unsegmented polymorphonuclears. The corrected sedimentation rate was 32 mm. in an hour. A catheterized specimen of the urine was negative and a culture revealed no streptococci. A phenolsulfonphthalein test revealed 30 per cent excretion at the end of fifteen minutes, and 65 per cent excretion at the end of two hours. The nonprotein nitrogen was 30 mg. per 100 cc. Total serum proteins were 6.2 Gm. per 100 cc.—albumin 4 Gm., and globulin 2.2 Gm. The serum bilirubin was 0.6 mg. per 100 cc. The prothrombin time was 16.5 seconds, against a control of 15.8 seconds. The coagulation time was 10 minutes (Lee-White method).

An electrocardiogram revealed no evidence of myocardial disease. A fluoroscopic and film examination of the chest with a barium swallow revealed the lung fields to be clear; no enlargement of the cardiac chambers or displacement of the esophagus was noted.

Cultures of blood drawn on the first and second days were positive for alpha hemolytic streptococci.* The plates contained 50 to 60 colonies per cubic centimeter. Sensitivity studies in broth and on agar media were done by the serial dilution method outlined by Meads and others[1]. The organism was resistant to penicillin in concentrations greater than 0.16 units per cubic centimeter and to streptomycin in concentrations greater than 20 micrograms per cubic centimeter. It was susceptible to aureomycin (0.25 micrograms per cubic centimeter) and to chloramphenicol (6.2 micrograms per cubic centimeter).

Course in the hospital

Following the identification of the organism and the **in vitro** sensitivity tests, aureomycin was given intravenously in doses of 200 mg. every eight hours, with 10 cc. of leucine buffer as a vehicle. Because the supply of parenteral aureomycin was limited, the drug was given orally in doses of 6 Gm. per day (1.5 Gm. every six hours) after three days of intravenous therapy. Four transfusions of whole blood were given, and the hemoglobin rose to 14.8 Gm.

On the fifth day of therapy, a dull headache and moderate nuchal rigidity appeared. Lumbar puncture revealed a cell count of 18, with 16 polymorphonuclears and 2 mononuclears. No organisms were seen on smear, but culture revealed an organism similar in growth characteristics to that found in the blood, but susceptible to penicillin 0.04 units per cubic centimeter and to 0.5 micrograms of aureomycin per cubic centimeter. By the following day the meningismus had subsided, and two subsequent lumbar punctures revealed no growth. The patient was afebrile and her pulse rate was normal from the eighth through the thirty-eighth day of therapy.

During the period of oral therapy, blood levels of aureomycin were determined by a two fold serial dilution technique and by a modification of a three hour turbidimetric method[2]. Average concentrations three and four hours after each dose were 6.1 micrograms per cubic centimeter. Judging from the **in vitro** sensitivity tests, this level was thought to be adequate. It should be noted that during this period of clinical remission, blood cultures were obtained daily. Occasional cultures (nine in all)

*All blood cultures made while the patient was in the hospital were planted with penicillinase.

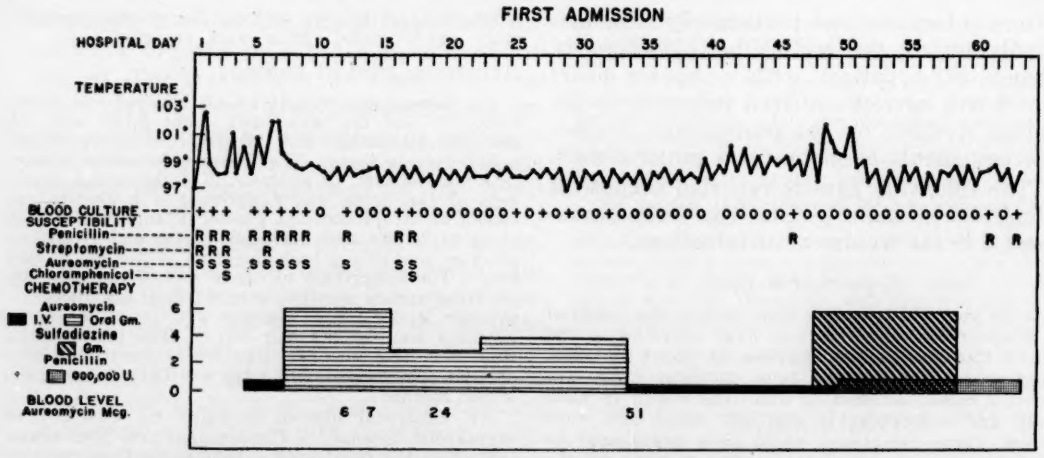

Fig. 1. Correlation of the temperature curve with bacteriologic studies in a case of bacterial endocarditis. The symbol † indicates one or more positive blood cultures on that day; the symbol O indicates one or more negative cultures on that day. The organism recovered from the blood was considered resistant (R) to penicillin if growth was not inhibited by 0.04 units per cc. Resistance to streptomycin was indicated by failure of inhibition at 20 micrograms per cubic centimeter. Susceptibility (S) to aureomycin indicates inhibition by concentrations of 0.5 micrograms per cubic centimeter or less; susceptibility to chloramphenicol is indicated by inhibition by 6 micrograms per cubic centimeter or less. (The results were charted to the closest whole number.) The overlapping of the symbols for chemotherapy at the right of the chart indicate combined therapy.

were positive, showing a growth of one to two colonies per cubic centimeter on pour plates.

Severe nausea and vomiting resulted from the oral administration of 6 Gm. of aureomycin per day. These symptoms could not be alleviated by the usual measures, including atropine, sedatives, and carminatives. The dose was therefore decreased to 3 Gm. per day (500 mg. every four hours), on the sixteenth hospital day, and the drug was enteric coated by our pharmacy. Toxic symptoms were then negligible. Since cultures remained intermittently positive, the dose was increased to 4 Gm. per day on the twenty-third hospital day, without the recurrence of toxic symptoms.

A new supply of parenteral aureomycin was obtained, and intravenous administration of the drug, in doses of 200 mg. every eight hours, was instituted on the thirty-fourth hospital day. Blood concentrations of 5 to 6 micrograms per cubic centimeter were obtained two hours after an injection. On the fortieth hospital day, because of thrombosis of all available superficial veins, a polyethylene tube was inserted into the right saphenous vein and a continuous drip maintained by alternating one liter of normal saline with two liters of 5 per cent glucose in water, 150 mg. of aureomycin being injected into the tube every six hours. Five days later the temperature began to fluctuate, reaching a height of 102 F. daily, with a concomitant elevation of the pulse rate to 120. Blood cultures during this time revealed no growth. In spite of anticoagulant therapy with heparin and Dicumarol, thrombophlebitis developed in the right calf, and the polyethylene tube was removed.

On the fiftieth day, aureomycin was discontinued, after penicillin and sulfadiazine were substituted. She received 1,000,000 units of aqueous penicillin intramuscularly and 6 Gm. of sulfadiazine orally per day. The hemoglobin, which had fallen to 9 Gm., was raised to 13 Gm. by a transfusion of 500 cubic centimeters of whole blood. It was maintained at that level without further transfusions.

During the last two weeks of hospitalization, the temperature and pulse were normal, and blood cultures taken during this time had revealed no growth when the patient was discharged on the sixty-third hospital day. She had gained 6 pounds in weight during her hospital stay, and had no subjective symptoms other than despondency and emotional liability. There had been no signs of cardiac decompensation, and the functional capacity of her heart, according to the criteria established by the New York Heart Association, was judged as grade I[3]. The systolic murmur did not change in character, and the spleen was never palpated. The white cell count had ranged between 5,000 and 10,000 and the sedimentation rate had varied from 2 to 41 mm. in an hour, without relation to the clinical picture. Frequent urinalyses and urine cultures were never remarkable.

Five days following the patient's discharge, blood cultures which had been planted on the sixty-first and sixty-third hospital days were found to be positive, growth having been delayed.

Course at home

The patient was discharged on May 19, 1949, with instructions regarding modified activity, and was told to continue penicillin in the same dosage (1,000,000 units per day). In addition, iron and vitamin supplements were given. She felt very well for approximately one week, and then began to have fever (100-101 F.), with elevations in the pulse rate (95-100). Blood cultures taken at home were positive, showing a growth of a similar organism. Sulfadiazine in doses of 4 Gm. per day was again prescribed, and on June 7 the dose of penicillin was increased to 2.5 million units per day. She continued to have fever, however, and cultures remained positive.

Sensitivity tests with chloramphenicol revealed the organism to be susceptible to the drug in concentrations of 6.3 micrograms per cubic centimeter. Penicillin and sulfadiazine were discontinued, and chloramphenicol was given in doses of 4 Gm. daily on June 14. Despite this measure, the patient had step-like rises in temperature with daily chills. The temperature reached a height of 103 F., and hospitalization was advised.

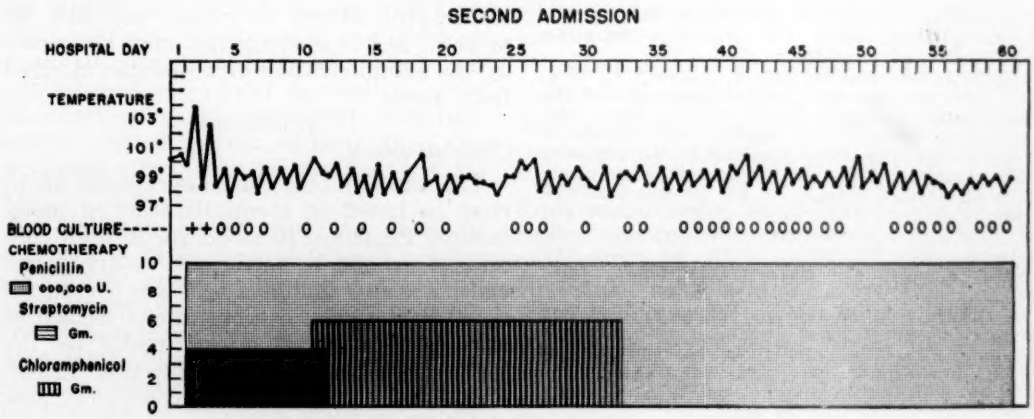

Fig. 2. Second hospital admission. Symbols are the same as in fig. 1.

During the two weeks prior to the second admission, subjective symptoms of decreased cardiac reserve appeared, and the functional capacity was lowered to grade III.

Second admission

The patient was re-admitted to the North Carolina Baptist Hospital on June 26, 1949. Her temperature on admission was 100.4 F., her pulse 104, blood pressure 120 systolic and 75 diastolic, weight 156 pounds. She appeared pale and tired but not acutely ill. The general physical examination was essentially the same as on the first admission. The intensity of the heart murmur had increased, but it had not changed in character and again no diastolic murmur was heard. The spleen could not be palpated.

The blood count showed 8.3 Gm. of hemoglobin and 2,700,000 red blood cells. The other studies of the blood, urine and heart showed no essential change from the first admission. The vital capacity was 2.8 liters; circulation time from arm to tongue, tested with a 10 per cent solution of calcium gluconate, 18 seconds.

Blood cultures made on the second and third day were positive, showing 30 to 40 colonies of organisms per cubic centimeter. The cultural characteristics of these organisms were similar to those isolated on the first admission. Susceptibility tests revealed the organism to be resistant to penicillin in concentrations of 4.0 units per cubic centimeter, but sensitive to chloramphenicol (6.2 micrograms per cubic centimeter), streptomycin (6.2 micrograms per cubic centimeter) and aureomycin (0.5 micrograms per cubic centimeter).

On the second hospital day, the intramuscular administration of penicillin in daily doses of 10,000,000 units (1,000,000 units per injection), and of dihydrostreptomycin 4 Gm. daily (0.5 Gm. per injection), was begun. Because of the low functional capacity of the heart, persistent tachycardia, the increased intensity of the second pulmonic sound, and the apical systolic murmur, she was digitalized and then maintained on daily doses of 0.1 Gm. of digitalis.

After the fourth hospital day her temperature remained between 98.6 and 99.6 F., with sporadic elevations to 100 F. Blood cultures made after the second hospital day revealed no growth. Throughout this admission the pulse rate was very labile, fluctuating between 80 and 110.

Because of induration, tenderness, and the formation of sterile abscesses in the gluteal region, streptomycin was discontinued on the eleventh hospital day, and chloramphenicol in oral doses of 6 Gm. per day was substituted. This drug produced anorexia and nausea, but no vomiting. These symptoms subsided after discontinuance of chloramphenicol on the thirty-second hospital day.

After the other antibiotics were discontinued, blood levels of penicillin, determined by the serial dilution technique in liquid media, were 8 units per cubic centimeter one hour and 4 units 2 hours after a dose.

On the twenty-fifth and fifty-fourth hospital days, embolic episodes occurred. The first was characterized by local erythema of the medial aspect of the right ankle and pain on weight-bearing. The temperature rose to 100 F., and the pulse rate to 100. The second episode involved the second toe on the right foot, with reddening and pain over the terminal phalanx. Blood drawn at the time of these episodes was sterile on culture. The signs and symptoms subsided within twenty-four to forty-eight hours after each episode.

Throughout this admission, the patient had few complaints. The systolic murmur did not change in character or intensity, and the spleen was never palpated. Because of tachycardia and exertional dyspnea, she was maintained on digitalis and a low sodium diet. Accessory vitamins, ferrous sulfate and symptomatic therapy were given as needed. Periodic transfusions of whole blood maintained her hemoglobin at a level of 13.6 Gm. The white blood cell count fluctuated between 6,000 and 8,000, and the sedimentation rate never fell below 30 mm. per hour.

On the fifty-ninth hospital day (August 24, 1949) the patient was discharged with instructions to continue penicillin in doses of 10,000,000 units per day, as well as her other medications (digitalis, ferrous sulfate, and accessory vitamins). Modified activity was allowed. Her weight on discharge was 145 pounds.

Twenty-two-month follow-up

Since blood cultures during the six weeks following discharge revealed no growth, the dosage of penicillin was cut to 2,000,000 units per day and continued through October, 1949 (four months after discharge). Numerous blood cultures made since that time have revealed no growth. During her entire illness she received a total of 1,051,000,000 units

of penicillin, 164 Gm. of chloramphenicol, 36 Gm. of dihydrostreptomycin, 130 Gm. of sulfadiazine, and 124 Gm. of aureomycin.

Digitalis was discontinued in January of 1950, and there are now no signs or symptoms of decreased cardiac reserve. Examination in May, 1950, revealed the heart to be smaller, with sounds of better quality and some lessening in the intensity of the systolic murmur. An electrocardiogram showed no significant change. At the present time she is taking no medication except ferrous sulfate and has no objective or subjective disability. The sedimentation rate, hemoglobin, white cell count, and differential count are within normal limits (June, 1951).

It should be noted that in February, 1950, she had an episode of nasal stuffiness with purulent post-nasal drip, cough, and frontal headache, accompanied by low-grade fever. This was treated satisfactorily with antihistaminics and 2,000,000 units of penicillin per day for six days.

Comment

The interval of five months before the diagnosis was established in this case is not unusual. The organism must have been one of low virulence and low invasiveness, to judge from the slow progression of the disease and the fact that complications were not too serious. The variability of the organism in its growth characteristics and its susceptibility to antibiotics made it difficult to decide whether it was an enterococcus which had entered from the gastrointestinal or urinary tract, or an alpha hemolytic streptococcus from the respiratory tract. The absence of symptoms suggesting diminished cardiac reserve failed to call attention to the heart as a source of infection at the beginning of the illness.

The slow sedimentation rate on admission, coupled with the low leukocyte count, added further difficulty to the diagnosis. The relatively benign meningitis was probably a further reflection of the low virulence and low invasiveness of the organism. The organism grown from the spinal fluid reflected the tendency of the parent organism to mutate and to vary in its sensitivity to antibiotics as well as in its colony characteristics.

The slow rate of growth of the organism when it was first isolated probably resulted from the sporadic therapy with penicillin for the symptoms of sinusitis. A similar slow growth was noted in cultures made just before the patient's discharge. Very few organisms appeared in the last positive cultures; in fact, on one culture only a single colony grew out several days after the patient had left the hospital. The symptoms of sinusitis were probably aggravated by some degree of hypersensitivity to the infecting organism. It should be recalled that nasopharyngeal allergy to molds may also be present, and that symptoms may be caused by the administration of antibiotics derived from molds.

Treatment

Chemotherapy

The selection of a chemotherapeutic agent must be based on a consideration of many factors. Penicillin in moderate to high concentrations may be bacteri*cidal* to organisms which are only inhibited by lower concentrations. Bactericidal concentrations seemed to have been achieved intermittently by the high doses of penicillin given to this patient. Streptomycin, under certain conditions, may also be bactericidal. Aureomycin and chloramphenicol, on the other hand, are predominantly bacterio*static* drugs. These facts, together with the knowledge of the relative toxicity of the drugs, the cost, and the total dose required, should be considered along with the results of the laboratory studies on the susceptibility of the organism involved, in planning chemotherapy.

In endocarditis the effectiveness of the chemotherapeutic agent is dependent upon its ability to penetrate into heart valves, and this ability in turn depends upon a high level of the drug in the serum, and the maintenance of this level over a period of time. In certain types of infection, intermittently high levels or peaks superimposed upon a constant but lower level are desirable. Such peaks were obtained by the intermittent intravenous administration of aureomycin and by the use of a penicillin preparation which combined the slow acting and the rapidly absorbed form of the drug. High levels of penicillin may also be obtained by the simultaneous administration of drugs which block the enzymatic transport of the antibiotic across the renal tubules and hence inhibit excretion. Such a drug, caronamide, was tried on the case presented, but the rapid appearance of red blood cells in the urine necessitated its immediate withdrawal[4]. Newer drugs with fewer toxic manifestations, such as Benemid, are now available and give promise of having a useful place in the treatment of such cases[5].

Combined therapy with two different antibiotic agents in the usual doses often is found more effective than high doses of a single drug. For example, it has been reported that enterococcal infections will respond to the simultaneous administration of penicillin and streptomycin, when neither drug

alone is effective[6]. In the case reported here, a short course of streptomycin was given on the second admission. The period of its administration was so brief in relation to the total duration of treatment with penicillin, however, that it seems unlikely that this synergistic effect was responsible for the cure.

We feel that the infection was cured by the prolonged high levels of penicillin. Since resistance to penicillin develops gradually, drug-fastness should be considered as a relative phenomenon. Evidence has been presented which suggests strongly that drug-fastness originates independently of antibiotics through spontaneous mutation of the bacteria; the antibiotic acts only as a selective agent, suppressing the growth of susceptible organisms and allowing the rare mutant to grow[7]. Resistance to the action of penicillin usually develops in a series of small steps. A high degree of resistance to streptomycin may develop either gradually or in a single step. That a moderate degree of drug-fastness can be effectively overcome by massive chemotherapy is well illustrated by this patient's course during her second admission.

An interesting speculation is the possibility that cure may have been delayed by the simultaneous administration of chloramphenicol and penicillin; it has been reported that chloramphenicol has an antagonistic effect on the bactericidal action of penicillin if its administration precedes the dose of penicillin[8].

The interpretation of *in vitro* tests of susceptibility is often difficult. This difficulty is illustrated in the present case by the fact that aureomycin and chloramphenicol—both of which, according to *in vitro* tests, appeared to be effective at the levels attained in the blood—failed to produce a cure[9]. The size of the inoculum and the pH of the media required for *in vitro* testing, as well as variations in the extent antibiotics are inactivated by protein, all affect the results of the tests. The rapid destruction of aureomycin *in vitro* makes interpretation of susceptibility tests and blood levels difficult. Furthermore, *in vitro* testing as it is usually performed does not take into account the immune mechanism of the host. In the eradication of an infection, inhibition of the growth of organisms by chemotherapeutic agents is only part of the story. The immune bodies produced by the host and the phagocytic activity of the white cells and reticulo-endothelial cells are equally important.

Treatment with chemotherapeutic agents, particularly antibiotics, may be extremely difficult in an allergic individual. Signs of intolerance to antibiotics must be carefully evaluated, in order to differentiate local symptoms of little significance (such as the nausea and vomiting observed after oral administration of aureomycin) from more serious toxic manifestations. Minor symptoms may often be controlled by spacing the doses, coating the drugs, administering them with food, and other simple measures. Materials (such as kaolin and amphoteric aluminum hydroxide) which tend to absorb substances given simultaneously should be used with caution. The relief of gastrointestinal symptoms following their use is the result of fecal excretion of the adsorbed antibiotic so that its absorption from the intestine is reduced; the therapeutic effect is thus diminished. More pronounced manifestations may be controlled by the simultaneous administration of antihistaminic drugs, as was done in the case reported. The sore mouth, tongue, or rectum sometimes seen after administration of the newer antibiotics may be controlled or lessened in severity by simultaneously giving whole vitamin B complex parenterally. The speed with which these symptoms appear following either intravenous or oral administration is too rapid to be explained by inhibition of vitamin synthesis in the bowel by reduction in the number and change in the bacterial flora. The symptoms must be a reflection of a more basic interference with utilization by body cells of some component of the B complex which produces lesions reminiscent of pellagra. Symptoms of intolerance can often be allayed by reducing the dose of a drug, but this measure often defeats the purpose of therapy.

Supportive therapy

The need for attention to supportive measures is shown by the necessity for transfusion in this case. During the first admission alone two transfusions were required to replace blood taken for blood cultures, assays of antibiotic concentration, and blood chemical determinations.

The diet should be relatively high in protein to compensate for exhaustion of protein stores from the increased metabolism of fever as well as the destruction of tissues by embolic infection[10]. The intake of all vita-

mins, particularly those stored with protein, should be increased, especially if antibiotics are being administered.

Complications

Once the diagnosis is established, therapy should be as vigorous as possible, in order to prevent the development of cardiovascular, renal, or cerebral complications. The tendency for congestive failure to develop as the disease continues unarrested is well illustrated by the present case. The fact that the character of the murmur changed very little suggests that the diminished function resulted from myocarditis caused by multiple tiny emboli rather than from an increase in the defect on the valve. The gradual improvement in function which took place during convalescence, after the infection was arrested, offers further support to the impression that embolic myocarditis rather than a valvular defect was the cause of the mild congestive failure.

Embolic nephritis was not a problem in this case. The slight elevation in the nonprotein nitrogen noted as the disease progressed probably resulted from the embolic destruction of glomeruli and from an increase in interstitial fibrosis between renal tubules.

The meningitis was a reflection of tiny metastatic lesions to the brain or meninges. Because of the small size of the lesions and the susceptibility of the organisms recovered from the spinal fluid to the antibiotics used, the meningitis subsided promptly, without necessitating intrathecal therapy.

Venous spasm, pain, or other evidence of local irritation are often the first warning of an impending thrombophlebitis. Thrombophlebitis may result from the altered coagulability of the blood seen in many infections, or may be caused by chemotherapeutic agents. The routine use of anticoagulants in endocarditis to prevent further deposition of fibrin on the vegetation in the heart or to prevent phlebothrombosis has proved too dangerous. Complications such as cerebral vascular accidents are frequent in cases of endocarditis treated with anticoagulants. In the present case, the administration of procaine and of drugs which block autonomic nervous impulses (such as Etamon) was relatively ineffective in controlling the symptoms of local irritation and of thrombophlebitis during the intravenous administration of aureomycin.

Embolic phenomena vary in prominence with different cases. The tender joints noted five months before admission as the initial manifestation may have been due to emboli. The two embolic episodes described during the second admission were probably due to the breaking off of superficial portions of the vegetations as the heart valves were repaired at the endothelial surface. Blood cultures taken as soon as embolic symptoms appeared were sterile, and no local signs of inflammation suggesting abscess formation appeared. Embolic phenomena of this type may appear after chemotherapy is discontinued; it is then often difficult to determine whether the emboli reflect healing or whether a relapse is imminent..

Summary

1. In a stubborn and protracted case of subacute bacterial endocarditis, eventual cure was produced by massive doses of penicillin after aureomycin, chloramphenicol, streptomycin and sulfadiazine, singly or in combination with penicillin, had failed.

2. The dangers of inducing drug-fastness in organisms by treating minor symptoms with chemotherapeutic agents is emphasized.

3. Drug-fastness to penicillin, and probably to aureomycin and chloramphenicol, is a relative phenomenon and may be overcome by massive or combined chemotherapy.

4. *In vitro* sensitivity tests and blood levels serve as a rough guide to therapy.

5. In a disease which is prone to produce serious damage to the myocardium, kidneys and central nervous system, vigorous treatment with specific chemotherapy and with meticulously planned supportive therapy should be instituted at the earliest possible moment, revised as complications arise, and pursued until cure is definitely assured.

6. The leukocyte count, erythrocyte count, sedimentation rate, and temperature curve may all be misleading in determining activity of the infection; in the present case the symptoms of the patient proved the best prognostic guide.

7. Embolic episodes which occur during a period of clinical and bacteriologic remission do not necessarily alter the prognosis or hinder the ultimate outcome.

Conclusion

This case illustrates the importance of accurate diagnosis in patients with known heart lesions before therapy is instituted. It

is now well recognized that inadequate courses of chemotherapy will alter the nasopharyngeal flora, allowing relatively resistant organisms to persist[11]. Fortunately, the resistant organisms are often replaced by the normal flora after the drug is withdrawn. The increasing frequency with which drug-fast strains are found in random cultures of the respiratory and genitourinary tracts, however, indicate that this problem is more than an academic one and is becoming one of clinical importance.

The development of potent chemotherapeutic agents has resulted in the appearance of a new syndrome—healed bacterial endocarditis. As the damaged heart valve is repaired the scar tissue contracts, increasing the valvular defect. More and more patients are now dying from cardiovascular or renal failure weeks to months after a bacteriologic cure of the infection has been produced.

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In a world in which cooperation on the political level seems at present an unrealizable dream, it is heartening to recall that it has existed for a long time in the field of health. Widespread public health is both an instrument and a condition of any lasting peace. Dr. F. W. Behmler, Minnesota's Health, October, 1950.

THE DIAGNOSIS OF MUMPS MENINGOENCEPHALITIS

GEORGE E. PRINCE, M.D.

GASTONIA

Meningoencephalitis is a common complication of mumps which when present without parotid swelling is difficult to diagnose. The history of exposure to mumps, with the development of lethargy, headache, vomiting, and nuchal rigidity in a patient whose spinal fluid contains a high leukocyte count, of which at least 90 per cent are mononuclear cells, strongly suggests the presence of mumps meningoencephalitis. The spinal fluid white cell count often exceeds 200 per cubic millimeter, and the protein content of the fluid may be elevated. The diagnosis can be made with certainty only by examination of serum taken during the active and convalescent stages, or by the isolation of the mumps virus. Mumps complement fixation tests or inhibition of hemagglutination may be carried out on the sera thus obtained, and if there is an increase in complement–fixing antibodies or in antihemagglutinins, the diagnosis is considered established.

Diagnostic Tests

Kane and Enders first used the complement fixation test for the study of mumps[1]. Henle, Henle, and Harris have used two antigens, S and V, for the mumps complement fixation test[2]. Antibodies to the S antigens usually appear first and disappear within six to twelve months. The anti-V antibodies appear later, but tend to remain at a level of 1:4 or 1:8 throughout life in a person who has had mumps.

Henle and McDougall demonstrated the ease in which the virus can be isolated from the spinal fluid[3]. In twenty-one attempts to isolate the mumps virus from patients with clinical mumps meningoencephalitis, Kilham was successful in all cases[4]. The positive serologic tests and the isolation of the virus were thus correlated, and the serologic tests alone seem adequate to make a definite diagnosis in most instances. The demonstration of the development of mumps antibodies by changes in the reaction of the patient's skin to the mumps antigen may also prove helpful in the recognition of the disease.

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*The complement fixation tests were done by the Public Health Service, Communicable Disease Center of Montgomery, Alabama.

Case Reports

The following case reports demonstrate the similarity of clinical and laboratory data in these patients and the ease with which the correct diagnosis can be made even in small communities.

Case 1

A 6 year old white male was seen on March 30, 1950, because of headache and vomiting of twenty-four hours' duration. His temperature had been elevated to 103 F. the previous night. He had been exposed to mumps seventeen days previously, but had no parotid or submaxillary swelling. There was no past history of mumps. Tonsils and adenoids had been removed at age of 4 years. Two teeth had been extracted four months previously, and the upper central incisors are now in the process of erupting. His hearing had been poor for several years.

Physical examination revealed a well developed and well nourished white male who appeared apprehensive but not severely ill. His temperature was 104 F. The skin was dry but clear. Examination of the eyes showed the vision to be good, the pupils not dilated and responsive to light, and the fundi normal. The tympanic membranes of the ears were scarred and retracted, and hearing was decreased bilaterally. There was no nasal obstruction. The upper central incisors were erupting. There was no parotid swelling or cervical lymphadenopathy. Heart and lungs were normal. The abdomen was flat, and there was no enlargement of the liver or spleen.

Neurologic examination disclosed no evidence of muscle weakness or cutaneous sensory changes. The tendon reflexes were active and equal. When the patient was lying on his back, flexion of the neck forward was resisted, and when sitting with the legs extended he assumed a "tripod position." Passive leg raising produced pain in the back, but there was no evidence of muscle tenderness.

Laboratory findings on admission were: hemoglobin 12 Gm.; white blood count 6,200 per cubic millimeter, of which 67 per cent were polymorphonuclear neutrophils, 32 per cent were small lymphocytes, and 1 per cent were monocytes. The spinal fluid was clear, and flowed freely. The Pandy test was reported 1 plus. White cell count of the spinal fluid was 400 per cubic millimeter. All cells were mononuclear. Spinal fluid chlorides were not determined, and the spinal fluid sugar was within normal range.

The patient received no chemotherapy or antibiotics and the following day seemed much improved. His headache was gone, but his temperature was 104 F. The body temperature spiked daily to 103 or 104 F. until the sixth hospital day, when it returned to normal. On this day his spinal fluid was again examined and found to contain 100 white cells per cubic millimeter: 98 were mononuclear and 2 were polymorphonuclear. The Pandy test showed a trace. The patient appeared well, and when examined in the office ten days after discharge from the hospital showed no evidence of muscle weakness or stiffness of the back or neck.

Two blood samples were taken for mumps complement fixation. The first specimen was obtained on admission and the other five weeks later. The first sample was destroyed in transit to the laboratory, but the convalescent serum gave a positive complement fixation in a 1:16 dilution.

Case 2

A 4½ year old white male was seen April 21, 1950, because of elevated temperature, vomiting, and severe headache for the past twenty-four hours. A history of bilateral parotid swelling occurring one week ago was obtained. There was no complaint of muscular pain or weakness.

Physical examination revealed a well developed white male who appeared alert but acutely ill. His temperature was 102 F. His skin was clear of rash. The eyegrounds appeared normal, and eardrums showed no inflammation. The nose and mouth appeared normal, and there was no evidence of recent tooth extraction or operation on the nasopharynx. The heart and lungs were thought to be normal. There was no enlargement of the liver or spleen. There was no generalized lymphadenopathy or evidence of parotid or submaxillary swelling.

Neurologic examination disclosed no evidence of muscle weakness or cutaneous sensory changes. The tendon reflexes were active and equal. When sitting on a hard, flat table with legs extended, the boy was able to lean forward and touch his toes, but was unable to place his forehead on his knees. When lying on his back, he could bring his head forward until his chin touched his chest without producing pain. Leg raising test was thought to be normal.

Laboratory findings showed the hemoglobin to be 11 Gm., white blood count 8,400 per cubic millimeter, of which 59 per cent were lymphocytes, 4 per cent monocytes, and 27 per cent polymorphonuclear cells. The spinal fluid was clear, the pressure not taken. The white cell count of the spinal fluid was 600 per cubic millimeter. Five hundred and eighty of these cells were mononuclear, and 20 were polymorphonuclear. The Pandy test was slightly positive, and the sugar content normal. Total protein and chloride determinations were not done on this fluid.

No medication was given. The day following admission the boy appeared greatly improved, and his temperature was 100 F. Forty-eight hours later his temperature was normal, and he was apparently well. Follow-up examination, one week later, revealed him to be in good health. His tuberculin test (1:1000) was negative at that time.

Mumps complement fixation tests were not done, but this patient is included in this group because the history of parotid swelling and laboratory findings leave little doubt that he had mump meningoencephalitis.

Case 3

A five year old white male was first seen June 17, 1950. His present illness had begun one week previously with a small swollen gland below the right ear. He was treated by his physician for otitis media and cervical adenitis. He responded somewhat to sulfonamide therapy, but two days before admission his temperature became elevated. He also started vomiting and complaining of headache.

He had no past history of mumps, but had been exposed to the disease three weeks previously. He had had two teeth pulled one week previously.

Physical examination revealed a well developed slightly undernourished white male who appeared acutely ill. His temperature was 103 F. No rash was present. The pupils were not dilated; the fundi were normal. The tympanic membranes were not inflamed. There was no nasal obstruction. The tonsils were present. The upper central incisors were missing. There was no swelling of parotid or submaxillary glands. Heart and lungs were thought to be normal. There was no enlargement of the liver or the spleen. There was no generalized lymphadenopathy.

Neurologic examination disclosed no evidence of muscle weakness or cutaneous sensory changes. The tendon reflexes of the extremities were active and equal. The neck was not stiff. When sitting on flat table with the legs extended, the patient was

unable to touch his knees with his forehead. Passive leg raising was resisted.

Laboratory findings showed the hemoglobin to be 12 Gm. and the white blood count 9,200 per cubic millimeter, of which 36 per cent were lymphocytes, 2 per cent monocytes, and 62 per cent polymorphonuclear neutrophils. The spinal fluid obtained on admission was clear, and the pressure was slightly elevated. The white cell count of the spinal fluid was 800 per cubic millimeter, all of which were mononuclear cells. The Pandy test was slightly positive. Spinal fluid sugar was 60 mg. per 100 cc.

The patient received marked symptomatic relief following removal of 6 cc. of spinal fluid on the day of admission to the hospital. No medication was given.

His temperature returned to normal on the third hospital day. Spinal examination done one week after onset revealed no increase in the white cell count. Tuberculin test was negative. The mumps complement fixation test done on the serum obtained from the patient on the first hospital day was positive in a 1:8 dilution. The test performed on serum obtained from the patient six days later was positive in a 1:16 dilution.

Follow-up examination of the patient was negative, but his brother and father had mumps two weeks after child was discharged home.

Case 4

A 14 month old white male was seen on July 1, 1950, because of vomiting and fever of one day's duration. The baby was very fretful. This infant had been exposed to his aunt who had mumps, and her son had had mumps two weeks earlier. There was no history of injury to the mouth.

Physical examination revealed an infant with flabby musculature who was irritable but not severely ill. His temperature was 103 F. The anterior fontanelle was flat. Eyes, ears, and nose appeared normal. Twelve teeth were present, and none was in the process of erupting. The orifice of Stensen's duct showed no inflammation. Heart and lungs were thought to be normal. The spleen was not palpable. There was neither generalized lymphadenopathy nor parotid or submaxillary swelling. The testes had descended into the scrotum.

Neurologic examination disclosed no evidence of muscle weakness or cutaneous sensory changes. The tendon reflexes were active and equal. The neck was slightly stiff. There was no evidence of muscle tenderness.

Laboratory findings on admission were: hemoglobin 10 Gm., white blood count 6,200 per cubic millimeter, of which 58 per cent were lymphocytes and 42 per cent were polymorphonuclear neutrophils. Spinal fluid was clear, with a white cell count of 250 per cubic millimeter, of which 248 were mononuclear and 2 were polymorphonuclear. The Pandy test was slightly positive. Spinal fluid chloride was reported to be 680 mg. per 100 cc. Spinal fluid sugar was not decreased.

Although sedatives and aspirin were administered, the temperature spiked to more than 104 F. daily for four days. The day after admission bilateral parotid swelling was found to be present. The spleen was also palpable. After the fourth day the temperature returned to normal, and the infant made an uneventful recovery.

Mumps complement fixation tests were not done, because diagnosis was confirmed by the appearance of bilateral parotitis.

Case 5

An 8 year old white male was seen December 1, 1950, because of sore throat and fever of three days' duration. Severe headache and vomiting had occurred twenty-four hours before admission. His family physician found his neck and back to be stiff, and discovered that the left tympanic membrane was acutely inflamed. The child received sulfonomide drugs, penicillin, and aureomycin without responding, and was sent here with the diagnosis of possible meningitis. There was no past history of mumps, but a classmate of this child had had mumps two weeks earlier. The patient had had no teeth pulled in the past year, and there had been no operation on the nose or throat of this child.

The family history revealed that an aunt had active tuberculosis, and had recently been taken to a sanatorium for treatment.

Physical examination revealed a well developed dehydrated white male who appeared acutely ill. His temperature was 103 F. The skin was clear. Examination of the eyes showed the pupils to be equal and the fundi normal. The eyeballs were soft and appeared sunken. The right tympanic membrane appeared normal. The tympanic membrane on the left was inflamed and slightly bulging. There was no nasal obstruction. The tonsils were present. There was no swelling of the parotid or submaxillary glands. The heart and lungs were normal. There was no enlargement of the liver or spleen, and no abdominal tenderness.

Neurologic examination disclosed no muscle weakness or cutaneous sensory changes. The tendon reflexes of the extremities were active and equal. The neck was stiff. When the patient sat with his legs extended, he was unable to touch his toes or put his head forward to touch his knees with his forehead. Leg raising was resisted.

Laboratory findings on admission were: hemoglobin 11 Gm., white blood count 9,900 per cubic millimeter, of which 29 per cent were small lymphocytes, 1 per cent monocytes, and 70 per cent polymorphonuclear leukocytes. The spinal fluid was clear, and the pressure was 110 mm. of water. Acid fast and gram stains on the fluid were negative. Spinal fluid culture was negative. The white cell count on this fluid was 351 per cubic millimeter, of which 348 were mononuclear and 3 were polymorphonuclear cells. Roentgen examination of the chest showed no evidence of tuberculosis. Roentgenograms of the skull revealed no abnormalities. The tuberculin skin test and blood Kahn tests were both negative.

The boy received intravenous fluids, and was given penicillin for the severe otitis media present. No other medication was given. The course in the hospital was one of gradual improvement. By the fourth hospital day he had become more alert, his headache had disappeared, and he had begun to eat well.

On the seventh hospital day the spinal fluid was again examined. The fluid was clear, and the white cell count was 220 per cubic millimeter, of which 119 were mononuclear. Only 1 was polymorphonuclear. The protein content was 34 mg. per 100 cc., the chloride content 720 mg. per 100 cc., and the sugar 61 mg. per 100 cc.

The patient was discharged, apparently well, on the eighth hospital day, and when examined one week later showed no abnormal neurologic findings.

Three blood samples were obtained for mumps complement fixation tests. The first sample was taken the day of admission, and no complement fixing antibodies were present. The second specimen was taken on the eighth hospital day, and a titer of 1:64 was found. The last sample was obtained one week later, and the titer was found to be 1:32.

Comment

All five patients gave a definite history of exposure to mumps parotitis two or three

Table 1
Onset of Meningoencephalitis

Case No.	*Age of Patient (years)*	*Onset After Exposure to Mumps (weeks)*	*Parotid Swelling*
1	6	2½	None
2	4½	3	1 week previous
3	5	5	None
4	1.2	2	Day after admission
5	8	3	None

Table 2
Spinal Fluid Cell Count

Case No.	*Days after Onset*	*White Cells per cubic millimeter*	*Percent. mononuclear cells*
1	1	400	100
	5	100	98
2	2	600	96
3	1	800	100
	8	0	0
4	1	250	99
5	3	351	99
	9	220	99

weeks before the onset of meningoencephalitis. None of the patients had evidence of parotitis at the time of first examination, but one patient (case 2) had a history of parotitis one week previously, and another patient (case 4) developed bilateral parotid swelling the day after admission to the hospital. All patients had fever and vomited. Four patients complained of severe headache, and the other patient (case 4) was an infant who screamed and rolled his head as if in pain. The degree of nuchal rigidity was not great in these patients. Only two had stiffness of the neck, but none was able to lean forward and place his forehead on his knees.

These patients resumbled children with early poliomyelitis except for the absence of muscle tenderness. The apprehension was not great, and no reflex changes or muscle weakness could be demonstrated.

Only one patient (case 5) appeared to be seriously ill, and this illness was thought to be due in part to dehydration and acidosis. The diagnosis of tuberculosis was considered in this patient because of his exposure to this disease. The normal spinal fluid sugar and chloride, and negative tuberculin test, helped to exclude this diagnosis. Improvement without the use of streptomycin also made tuberculosis meningitis unlikely. The possibility of meningeal irritation secondary to severe otitis media, poliomyelitis, lymphocytic choriomeningitis, and other forms of encephalitis could not be excluded on the basis of physical or spinal fluid findings. The increase in mumps complement fixation antibodies confirmed the clinical impression of mumps meningoencephalitis.

As emphasized by Kilham[5], the most characteristic changes in the spinal fluid (table 2) is the rather high leukocyte count, with a large percentage of mononuclear cells. The spinal fluid cell counts done in the early stages of the disease revealed the lowest to be 250 per cubic millimeter; the highest, 800 per cubic millimeter. At least 96 per cent of the leukocytes were mononuclear cells. These findings are similar to those reported by Kilham and others, who also found that the total protein was elevated in the spinal fluid of most of his patients with mumps meningoencephalitis. Only 1 patient in this group had the total protein in the spinal fluid determined, and the values were found to be elevated.

It is of interest that one patient (case 3) had two teeth extracted during the incubation period of mumps, and one patient (case 1) had teeth in the process of erupting. There had been no operations on the nose or the throat of the other 3 patients. The first 4 patients became ill in the late or early summer, when the incidence of mumps meningoencephalitis without parotitis has been reported to be the highest.

The withdrawal of spinal fluid relieved the headache and vomiting in all patients. The temperature elevation was not lowered by the lumbar puncture, but returned to normal by the sixth hospital day in all five cases. Aspirin and barbiturates were used when necessary for restlessness.

A recent communication from Dr. Paul Hendricks of Kings Mountain stated that he was treating a colored female, age 12 years, who had mumps meningoencephalitis. She had had bilateral parotid swelling one week before onset of headache, vomiting, and stiff neck. Spinal fluid examination revealed a clear fluid, with 351 white cells per cubic millimeter. Three hundred and forty seven of these cells were mononuclear, and 4 were polymorphonuclear. The total protein of the spinal fluid was 45 mg. per 100 cc. The mumps complement fixation test done on the serum obtained during convalescence was positive in a 1:64 dilution. This makes the sixth case of mumps meningoencephalitis in Gaston County during the past 12 months.

Summary and Conclusions

1. Five patients believed to have mumps meningoencephalitis without parotitis are presented.
2. The diagnosis should be suspected in all patients who give a history of recent exposure to mumps, and who later develop evidence of meningeal irritation. The spinal fluid changes are suggestive, but not conclusive. Correct diagnosis can be established by physicians in even the smallest communities if they will obtain serum in the acute and convalescent periods and send it to one of the communicable disease centers for mumps complement fixation tests.

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THE MANAGEMENT OF STASIS DERMATITIS AND STASIS ULCER

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DURHAM

Stasis dermatitis and stasis ulcers of the lower extremities are common disorders in the older age group. By the time these patients are referred to the dermatologist, the condition has often been aggravated by overtreatment. Because patients with these disorders frequently present themselves to the general practitioner, the surgeon, and the internist, and because of the therapeutic problems they present, it is useful to review some principles of therapy, with emphasis on avoiding overtreatment.

Etiologic Diagnosis

The physician's first task when confronted by a problem in circulatory stasis of the lower extremities is to determine if possible the reason for the condition.

1. *Varicose veins* lead the list of etiologic factors. The diagnosis is usually obvious, although it must be borne in mind that edema of an extremity can hide underlying varicosities. The outward appearance of the veins does not necessarily parallel the severity of the stasis dermatitis, induration, or ulceration of the leg. In all patients with varicose veins, tests should be done to determine the competency of superficial, communicating, and deep veins[1].

2. *Post-thrombophlebitic edema* is another common etiologic factor.

3. *Arteriosclerosis* and *thromboangiitis obliterans* are the more common causes of arterial obstruction. Arterial competency is usually determined by palpation of the dorsalis pedis and posterior tibial arteries. Oscillometric studies and skin temperature studies may be helpful in the diagnosis of arterial disease. The study of patients should include urinalysis and blood sugar counts, if necessary.

4. *Local trauma and infection*, either bacterial or mycotic, frequently play a secondary role. Many persons may have adequate circulation in the lower extremities until trauma and/or infection induces edema and, not infrequently, dermatitis and ulceration.

5. *Chronic congestive cardiac failure* from any cause can produce edema and circulatory stasis in the lower extremities.

6. The possibility of *arteriovenous fistula* should be kept in mind. The common sites are the femoral triangle (femoral artery and vein) and the popliteal space (popliteal artery and vein). There may or may not be a history of trauma. Auscultation and the presence of a continuous bruit, with systolic accentuation, may confirm this diagnosis. Multiple congenital aneurysms may be present, and are frequently missed because they do not produce a bruit. The determination of blood pressure in the lower extremities is helpful. Arteriograms, when available, can also establish this diagnosis[1b].

7. Other conditions that need be considered are *lymphedemas*, which may be congenital (Milroy's disease) or acquired, and *elephantiasis nostras*. The latter condition is secondary to chronic and recurrent bacterial, viral, and mycotic infection.

8. A much rarer etiologic agent—seen as a rule in war and in persons subject to prolonged exposure to water and cold—is the so-called *immersion* or *trench-foot*. This condition often results in loss of a part or all of an extremity, and apparently produces chronic arterial disease.

9. Finally, there are patients who present

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all the clinical signs of stasis, with no apparent reason for the stasis. These patients are usually in the older age group. Placing the leg in the dependent position will result in the usual dusky, cyanotic type of erythema and eventually in swelling, even though there is no clinical evidence of varicosities, arterial stasis, and no history of antecedent thrombophlebitis. Stasis dermatitis and stasis ulcer can develop in these patients[1a].

Other differential diagnostic possibilities that deserve mention and need to be ruled out include *sickle cell anemia* with ulcers (Negro patients), and *drug eruptions* (particularly iododerma, bromoderma), syphilitic gumma, blastomycosis, and carcinoma[1a,b].

Treatment

The treatment of stasis dermatitis or stasis ulcer is much the same in all cases, whatever the cause. Chiefly it consists of measures to aid the sluggish circulation and to protect and soothe the damaged skin. In the initial phase of treatment, continuous bed rest and elevation of the affected part are essential. Elderly patients should have frequent periods of sitting up to avoid pulmonary difficulties; however, the legs should be kept on a level with the hips. Bathroom privileges may be allowed, but may be contraindicated in severe cases.

In the acute or weeping phase of the dermatitis, and in the presence of ulcers, continuous wet compresses and antiseptic solutions are indicated. The most convenient compress solutions to use are normal saline, Burow's solution (1:40), or potassium permanganate solution in 1:4000 or 1:6000 dilutions.

The compresses should be warm, and should be changed at least every three hours. Fresh solutions should be used at each change. Compresses may be covered and held on by a covering of "oiled silk," other plastic materials, or waxed paper, and an overlying wrap of elastic bandage. They should not be allowed to become dry.

Convenient and less irritating antiseptic paints are 1 per cent gentian violet in a 10 per cent solution of alcohol or zephiran chloride (1:1000), either as a colorless tincture or an aqueous solution. These preparations should be applied twice daily or oftener when the compresses are changed.

Patients may occasionally exhibit a generalized id reaction, which may be either bacterid, dermatophytid, or a reaction to breakdown products of the tissue and skin. This eruption is generally most marked over the hands and arms. The local application of shake lotions such as calamine lotion or liniment, along with oral antihistamine therapy and calcium gluconate administered intravenously, are helpful procedures in controlling symptoms of id reactions. Occasionally starch baths are helpful.

Where secondary bacterial infection is a major problem, the administration of sulfonamide drugs or penicillin may be helpful. In general, the local use of these drugs is to be avoided because of their high sensitizing potential.

A constant watch should be maintained for thrombophlebitis. If this complication occurs, Dicumarol or some other anticoagulant therapy should be initiated, along with penicillin.

In patients with varicose eczema and ulcer, any therapy short of vascular surgery—preferably combining high saphenous ligation with the stripping of superficial varicosities—is temporizing[1a]. Results are much better when the operation is performed early. Results are poorer, in general, in the postthrombophlebitic cases; in patients with long-standing, deep thrombophlebitis, surgery may even be contraindicated[2]. When ulcers do not heal under appropriate treatment, skin grafting is indicated.

Elastic bandages and stockings or gelatin boots have a definite place in the preoperative and postoperative therapy. They should not be used as a substitute for surgical intervention, except in those cases in which venous surgery is contraindicated. In general, patients should be instructed to keep their legs elevated as much of the time as possible, to avoid restricting bands of any kind about the legs, to maintain scrupulous cleanliness, and to treat any slight infection immediately.

Summary and Conclusions

In the management of stasis dermatitis accurate diagnosis is essential.

Therapeutic measures include (1) bed rest, (2) simple compresses and antiseptic paints, (3) penicillin and sulfonamides if indicated, (4) antihistamines, (5) shake lotions applied locally, and (6) support or gelatin boots.

Overtreatment should be avoided.

Vascular surgery should be employed as

soon as feasible in all patients with varicose eczema or ulcer.

Patients should be given adequate instruction as to the local care of the skin.

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CLINICAL EXPERIENCE WITH SURITAL SODIUM IN ANESTHESIA

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Since the introduction of Evipal in 1932[1] and Pentothal Sodium in 1934[2], the production of anesthesia by these ultra short-acting barbiturates has been accepted universally. For the patient, unconsciousness is produced rapidly and without anxiety or struggling. Recovery is usually pleasant and not associated with severe nausea. For the surgeon and anesthetist, the quick and usually uneventful induction saves valuable time, while interfering little with the metabolism of the patient.

At the same time it has been recognized that the present ultra short-acting barbiturates are not ideal[3]. Their undesirable effects on the respiratory system and on the parasympathetic system, combined with their so-called cumulative action, have become well defined. The search still proceeds for an agent which "acts promptly, is potent, is rapidly detoxicated and eliminated, has a low degree of toxicity, and has few deleterious side actions."[3]

With this end in view, another thiobarbiturate called Surital Sodium* has been developed. In chemical structure it is identical with Seconal, except that the oxygen on the basic ring has been replaced by sulphur. (Pentothal Sodium, in similar manner, is the sulphur analogue of pentobarbital.) Preliminary laboratory investigation[4] has revealed that in dogs Surital has about 1.5 times the anesthetic potency of Pentothal, but is definitely no more toxic than Pentothal[5]. The work on dogs also indicates that the cumulative effect of Surital is less than that of Pentothal. Preliminary clinical reports indicate that the agent is valuable in anesthesia and worthy of further trial[6].

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*We are grateful to Parke, Davis and Company for supplies of this material.

Table 1
Age of Patients Receiving Surital Sodium

Age (years)	No. Patients
2-20	144
21-30	202
31-40	199
41-50	224
51-60	190
61-70	105
71-87	40
Total	1104

During the last six months we have had the opportunity to assess the clinical value of Surital Sodium in 1436 patients. Of these, 1104 have been reviewed in some detail. All age groups were included (table 1), the youngest child being 2 years and the oldest adult 87 years. Surital was used whenever an ultra short-acting barbiturate was indicated. Pentothal Sodium was not substituted in any case during the trial period.

Solutions were prepared in a 2 per cent concentration, employing distilled water or normal saline as the diluents. Because of the apparent increased potency of Surital over Pentothal, milligram for milligram, it was felt that a 2 per cent solution would more closely approximate the potency, cubic centimeter for cubic centimeter, of the 2.5 per cent Pentothal solution used previously. This was found to be the case. Surital dissolved easily in this 2 per cent solution and did not show any precipitation when kept over a period of four days. Preparations of d-tubocurarine chloride, in concentrations of either 3 mg. per cc. or 15 mg. per cc., dissolved readily in Surital.

Clinical Applications

During this investigation, Surital was utilized in four variable ways. The dosage employed varied from 100 mg. to 2300 mg., always in a 2 per cent solution (table 2).

1. *Surital alone (36 patients)*: The number of cases in which the agent was used without supplement was small and was con-

Table 2
Dosage of Surital Sodium

Dosage	No. Patients
250 mg. or less	259
250-400 mg.	278
400-600 mg.	204
600-800 mg.	163
800-1000 mg.	135
1000-1500 mg.	41
1500-2000 mg.	23
2300 mg.	1
Total	1104

Table 3
Combinations of Agents Used with Surital Sodium

	No. Cases
Nitrous oxide-oxygen, curare	174
Nitrous oxide-oxygen, trichlorethylene, curare	86
Nitrous oxide-oxygen	77
Nitrous oxide-oxygen, ether (traces), curare	64
Nitrous oxide-oxygen, cyclopropane, curare	49
Ethylene-oxygen, cyclopropane, curare	41
Nitrous oxide-oxygen, ether	28
Ethylene-oxygen, curare	15
Cyclopropane-oxygen	12
Ethylene-oxygen	9
Nitrous oxide-oxygen, Avertin	1
Total	556

fined to minor surgical procedures. This was done because barbiturates are considered to be primarily hypnotic agents, and exert an analgesic action only by virtue of the depth of hypnosis they produce[9]. Therefore, if the surgical procedure was prolonged or associated with potent sensory stimuli, anesthesia was supplemented with analgesic agents. In this way large doses of the barbiturate were avoided, and the danger of inadequate pulmonary exchange was diminished.

2. *In combination with local and spinal analgesia to produce hypnosis only (45 patients)*: In a number of rhinoplasties, where local and topical analgesia was employed, small intermittent injections of Surital kept the patients lightly asleep without alarming respiratory depression. Of possible significance in this group was the fact that coughing or sneezing, common when Pentothal was employed, did not occur with Surital.

3. *For induction of anesthesia, and in association with curare for intubation (476 patients)*: Usually 9 to 12 mg. of d-tubocurarine chloride were given, followed by 200 to 400 mg. of Surital. Respiration was assisted with oxygen until sufficient relaxation was obtained for intubation. Syncurine, in a dosage of 2 to 3 mg., was found to be a satisfactory substitute for d-tubocurarine chloride in producing relaxation for this purpose.

4. *As one of several agents in balanced anesthesia (556 patients)*: In this group Surital was employed not only for induction, but by intermittent injections during the procedure. A summary of the several combinations used is seen in table 3. It is felt that by a proper balancing of several agents the toxic effects of any one are minimized, with profit to the patient and satisfaction for the surgeon and anesthetist[10]. Injections of Surital, 50 to 100 mg., from time to time aided greatly in maintaining the plane of anesthesia desired, without depressing respiratory exchange unduly, and without danger of barbiturate overdosage.

Results

Induction

Intravenous administration of Surital produced a quiet state of sleep which was not in any case associated with fear, anxiety, or excitement. Patients were usually unresponsive to their name after the injection of 100 to 150 mg. No idiosyncrasy to the drug was seen. In those patients in whom a Surital-curare induction was performed for the specific purpose of intubation, from 200 to 400 mg. of Surital were adequate in nearly every instance.

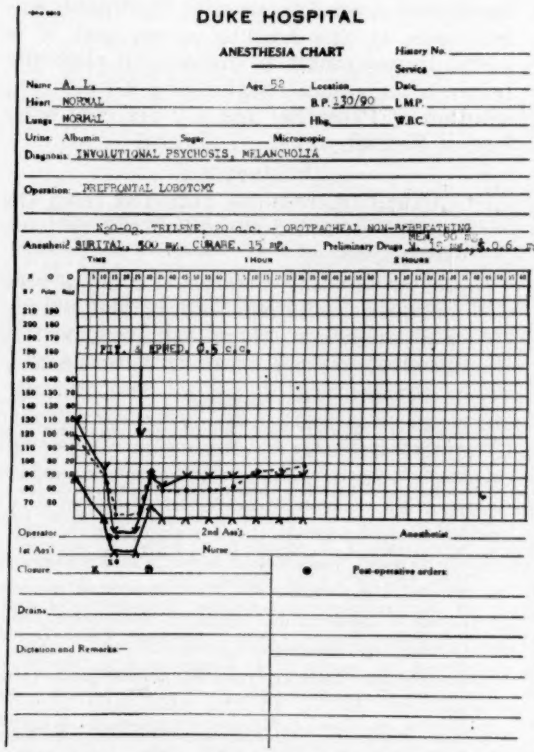
On two occasions a worrisome laryngospasm was encountered during the attempt at intubation. This was resolved when the laryngoscope was withdrawn and oxygen given with positive pressure inflation. In each case intubation was uneventful after further doses of curare and Surital.

Respiration

After the initial induction dose of Surital, respiratory exchange almost invariably diminished, and in the occasional "susceptible" patient apnea developed for one to two minutes. As far as one could judge from clinical observation, this respiratory depression was not more severe or prevalent than that seen with Pentothal. A reduced tidal exchange was never considered as cause for alarm, as respirations could easily be assisted by manual pressure on the reservoir bag of the anesthetic machine. Intermittent doses of 60 to 100 mg. during maintenance of anesthesia rarely altered the depth or rate of the respiratory pattern.

Circulatory changes

In about 30 of the patients a moderately


DUKE HOSPITAL

ANESTHESIA CHART

History No. _____

Service _____

Name A. L. Age 28 Location _____ Date _____

Heart NORMAL B.P. 130/90 L.M.P. _____

Lungs NORMAL Hbg. _____ W.B.C. _____

Urine Albumin _____ Sugar _____ Microscopic _____

Diagnosis INVOLUTIONAL PSYCHOSIS, MELANCHOLIA

Operation PREFRONTAL LOBOTOMY

N_2O-O_2, TRILENE, 20 c.c. - OROTRACHEAL NON-REBREATHING

Anesthesia SURITAL, 500 mg., CURARE, 15 mg. Preliminary Drugs M. 15 mg., S.O.6. mg.

Time 1 Hour 2 Hours

P 0 0

B/ Pulse Rate

210 190
200 180
190 170
180 160
170 150
160 140
150 130
140 120
130 110
120 100
110 90
100 80
90 70
80 60
70 50

PIT. & EPHED. 0.5 c.c.

Operator _____ 2nd Ass't _____ Anesthetist _____

1st Ass't _____ Nurse _____

Closure _____ Post-operative orders:

Drains _____

Duration and Remarks—

Fig. 1. Anesthesia chart (case 1). Pre-anesthetic blood pressure 130/90. After 500 mg. of Surital Sodium and 15 mg. of curare, blood pressure fell to 40/20 and pulse to 44, with some irregularities. When spontaneous improvement had not occurred after 10 minutes, 5 units of Pitressin and 3/8 grain of ephedrine was given intravenously, causing improvement in the circulatory dynamics.

severe blood pressure fall associated with bradycardia was observed during the induction period. By "moderately severe" is meant a systolic pressure which fell to 40 mm. of mercury or more below the pre-anesthetic level, and a significant bradycardia is considered a rate of 52 or less per minute. In 8 of these cases, a slow arrhythmia superimposed itself on the bradycardia. Occasionally the bradycardia was present without an associated hypotension. Figure 1 reproduces the anesthetic record of one of these patients.

These circulatory abnormalities were not confined to any particular age group, nor were they predominant in patients who had pre-existing hypertension or cardiovascular disease. In some patients "normal" status was restored without any specific therapy. In others 0.3 to 0.6 mg. of atropin, or 5 to 10 mg. of Methedrin, given intravenously, were successful in re-establishing normal circulatory dynamics. It is believed that an accentuation of the parasympathetic vagal tone is responsible for these alterations, and that they are prone to occur in "parasympathotonic" individuals[11]. There is also some evidence to indicate that the circulatory upset may result from a direct action on the heart[12].

Other reflexes

Severe laryngospasm associated with the administration of Surital was not encountered, except in the two instances noted with intubation. Hiccups occurred in several cases, but were not severe or protracted enough to present a problem in the anesthetic management.

Recovery

In this series, grimacing reflexes to painful stimuli or response to the spoken word were usually present before the patient left the operating room. In the recovery room the awakening period was not prolonged, and in only one patient was respiratory depression due to a possible cumulative effect of the drug a cause for concern. The following case history illustrates this point.

The patient, a thin phlegmatic man of 28 years, came to the operating room first on December 29, 1950, for the immediate transfer of a single pedicle abdominal flap to a granulating wound of the palm of the right hand. Preoperative physical examination was essentially normal. Blood pressure in the ward and on arrival in the operating room was 90 systolic and 50 diastolic. One hundred milligrams of Demerol and 0.6 mg. of scopolamine given fifty-five minutes before induction were adequate premedication. Over an anesthetic period of three hours 800 mg. of Surital Sodium and 12 mg. of d-tubocurarine chloride were given by intermittent injection, along with nitrous oxide-oxygen in a 70:30 proportion, administered by a partial rebreathing technique. The anesthetic course and recovery from this procedure were uneventful.

On January 19, 1951, this patient again came to the operating room, with the same premedication, for division of the abdominal flap to the palm and closure of the abdominal defect. On this occasion, over an anesthetic period of one hour, thirty minutes, he was given 1400 mg. of Surital Sodium, along with nitrous oxide-oxygen administered as before. The anesthetic course was uneventful, but almost twice as much Surital was given in half the length of time as compared to the first procedure. The reasons for this increase may be that a less experienced anesthetist was conducting the case, that more barbiturate was required in the absence of curare, or that sensory stimuli were more potent and more frequent. In any event, on return to the recovery room, the respirations were deep but very slow, varying between 4 and 6 per minute. Administration of oxygen by the nasopharynx was begun, and the patient was watched carefully. Within the next three hours, three intravenous injections of Coramine, 5 cc., were given. These produced coughing and transient improvement in the respiratory rate. After the third injection respirations were regular and deep at 8 to 10 per minute, and the patient would voluntarily increase his rate of res-

piration when it was demanded of him. However, it was not until midnight, fourteen hours after operation, that a rate of between 14 and 16 per minute was maintained. During this entire postoperative period the patient's color remained good, the pulse ranged between 60 and 80 per minute, and the blood pressure maintained itself at 90 to 110 systolic and 56 to 80 diastolic.

On January 24, 1951, this patient came to the operating room a third time for set-in of abdominal flap to the right hand. Premedication consisted of 100 mg. of Demerol and 0.1 Gm. of Seconal. On this occasion, a brachial block was done, employing 25 cc. of a 2 per cent solution of Xylocaine. The anesthetic course was uneventful, and no respiratory depression was noted during or after the operation.

It is felt that in the second operation a relative overdose of Surital was given, with a demonstration in the postoperative period, when painful stimuli were absent, of the cumulative effects of this barbiturate on the respiratory center. The first and third procedures served as controls to show that cumulative effects do not occur when dosage of the agent is watched carefully, and that there is no depressant effect from premedication alone.

Excitement and irrationality were displayed only once during the wakening phase. Tremors or "shaking" of the extremities in response to stimulation were no more common than after the administration of Pentothal, and less common than following the use of Evipal. Two deaths occurred in the series. In neither case could Surital be implicated in any way with the fatality.

Comparison with Pentothal Sodium

A discussion of any new ultra short-acting barbiturate involves a comparison with Pentothal. What undisputed advantages does it possess, if any, and are its limitations of more significance than those of Pentothal? To answer these questions on the basis of clinical impressions alone would be misleading. One cannot be exact and certain about variations which may occur in the clinical applications of drugs which have many properties in common.

Certain it is that Surital Sodium and Pentothal Sodium have many pharmacologic actions which are similar in nature, if not perhaps in degree. In the manner employed in this series we have found no outstanding differences between the two drugs. There may be less respiratory depression and a lower incidence of laryngospasm with Surital[6], but our clinical impressions alone cannot confirm it. It has been felt also that the circulatory disturbances seen with Surital are no more frequent or severe than those seen, from time to time, with Pentothal[12]. In fact, since we have become "circulation conscious" with regard to barbiturates, the phenomena observed with Surital have been duplicated several times with Pentothal. Anesthetists at this hospital agree that it is virtually impossible to distinguish clinically between the administration of a 2.5 per cent solution of Pentothal and a 2 per cent solution of Surital.

Summary

1. Clinical impressions gathered from the use of Surital Sodium in 1436 patients are presented.
2. No outstanding differences could be seen between Pentothal Sodium and Surital Sodium when given intravenously to produce or help maintain anesthesia.

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Search for Better Anesthetic Drug Ends In Parke-Davis' Development of Surital Sodium

A search of several years for a better all-around anesthetic drug has ended successfully in the development of Surital Sodium at Parke, Davis and Company.

Dr. E. A. Sharp, director of clinical investigation, explained recently, "Surital is a highly potent compound which has proved to be in some respects superior to any intravenous short-acting anesthetic agent now available."

Surital, a new thiobarbiturate, already has been found to be safe and effective on thousands of patients, he added.

Among its many advantages, he said, are high potency; smooth and rapid induction of sleep, free of undue excitement or irritability; early and easy recovery, with infrequent side reactions; minimum respiratory depression; applicability over a wide age range; and usefulness among infants and children because of its effectiveness rectally.

"Surital is currently available only to certain hospitals," he emphasized. "It will be several months before production allows general distribution."

CLINICAL IMPRESSIONS GLEANED FROM THE USE OF A NEW INTRAVENOUS ANESTHETIC, SURITAL SODIUM

ROSCOE L. WALL, M.D.

WINSTON-SALEM

The search for new anesthetic agents constantly continues. Of the many barbituric acid derivatives, only four—Amytal, Nembutal, Evipal and Sodium Pentothal—have received extensive clinical trial as intravenous anesthetic agents. None of them has adequately met the rigid requirements of the ideal anesthetic. To a greater or lesser degree they all cause respiratory and circulatory depression, laryngospasm, bronchospasm, and coughing. The very slow metabolic degradation and elimination of these drugs when given over a long period of time or in large quantities often produce an extended postoperative sleep. None of them alone provides adequate muscular relaxation for major surgery. Any new agent which might eliminate any or all of these drawbacks deserves investigation and clinical trial.

The Department of Anesthesiology of the Bowman Gray School of Medicine and the North Carolina Baptist Hospital has had the opportunity to investigate clinically the behavior of a new intravenous anesthetic agent — Surital Sodium*. It could be called the thio-analogue of Seconal just as Pentothal could be called the thio-analogue of Nembutal. A solution of Surital is yellower in appearance and has a stronger sulphurous odor than does an equal concentration of Pentothal. Investigators[1] have shown by experiments on animals that Surital has a potency of 1.5 as compared to 1.0 for Pentothal. They have also reported a more rapid induction and recovery period than with Pentothal. Finally, they found that Surital has a lower rate of accumulation, as based on the duration of anesthesia following repeated doses, and on the fact that it has practically the same toxicity as Pentothal.

Preliminary clinical reports[2] indicate that Surital Sodium is a valuable anesthetic agent and worthy of further clinical investigation.

From the Department of Anesthesia of the Bowman Gray School of Medicine and North Carolina Baptist Hospital.

*Surital Sodium used in this study was supplied through the courtesy of Parke, Davis and Company, Detroit, Michigan.

Material and Method

Since September, 1950, the Department of Anesthesia at the North Carolina Baptist Hospital has administered Surital Sodium to 747 patients. We have had the opportunity to observe its action in detail, and thus to assess its clinical value. Surital Sodium was used in all age groups, from the very young to the aged. Patients were about equally divided between the sexes. It was used in both poor and good surgical-risk patients, and with all types of surgical procedures. It has been administered as the sole anesthetic agent and as the primary anesthetic agent along with nitrous oxide, ethylene, cyclopropane and combinations of the above. It has been given as an induction agent for gas-oxygen-ether anesthesia, with d-tubocurarine and Syncurine for inductions and intubations, and for complementing and supplementing spinal and regional anesthesia.

Operations varied in length from five minutes to two hours and thirty minutes. Surital Sodium plus oxygen was administered as the only anesthetic agent in 633 operations, which ranged in duration from five minutes to two hours and ten minutes, the average duration being 24.6 minutes.

The average amount of Surital administered per patient was .45 Gm. It was administered both by the intermittent method, using a 2.5 per cent solution, and by the drip method, using a 0.5 per cent solution.

Surital Sodium was given with other single anesthetic agents, or combinations of agents in 53 cases, and for induction and intubation in 61 cases.

All patients received atropine or hyoscine with morphine or Demerol forty-five minutes to one hour pre-operatively, as is the routine practice with other anesthetic agents.

Induction and Maintenance Dosage

For induction and intubation, Surital Sodium was used 41 times. The average amount administered was 0.2 Gm., with an average dose of 2.5 mg. of Syncurine. This combination has proved to be ideal, and recently we have administered it routinely for most intubations. This combination depresses respiration less and is of a shorter duration than any other barbiturate used with either d-tubocurarine or Syncurine.

The inductions were smooth, quiet, and as rapid as with Sodium Pentothal. One case of excitement, caused by the application of

the face mask before the patient was entirely unconscious, occurred. The administration of oxygen is begun just as soon as the patient becomes unconscious, regardless of the length of the operation to be performed. By this method, anoxemia is prevented, thereby avoiding some of the complications that might have been encountered. The induction is always pleasant for the patient, as is usually the case with all intravenous agents.

Maintenance dosages of 25 to 50 mg. were given as indicated by the increased depth of respiration, phonation, return of eye-lid reflexes, or slight movement of the extremities. It is not difficult to keep patients in this light stage of surgical anesthesia when using Surital Sodium for minor operations. It was observed by the anesthesia staff that patients could be kept in a much lighter stage of anesthesia with Surital Sodium than with Pentothal Sodium. As a result, they do not respond to painful stimuli and, therefore, do not move. Although the barbiturates are not supposed to have any analgesic properties, we have concluded that Surital Sodium undobutedly does.

In long operations when the amount of Surital Sodium should be reduced, we have supplemented it with other anesthetic agents —namely, nitrous oxide, ethylene, and cyclopropane, used singly or in combination. Nitrous oxide oxygen was used most frequently. Even as lean a mixture as 50 per cent nitrous oxide with 50 per cent oxygen appreciably cut down the amount of Surital Sodium needed. To obtain surgical relaxation with the latter, we used d-tubocurarine or Syncurine.

Results

Reaction time

In general, the reaction and recovery time following the administration of Surital Sodium is much shorter than that of Pentothal. The patient was considered to have recovered when he reacted to stimuli or responded when his name was called. Patients varied in this respect, from awakening on the operating table, to awakening before reaching their room. In very few cases it took the patient more than an hour to recover. The average time of recovery in the 422 cases where Surital Sodium and oxygen alone were used was 7.7 minutes after the operation.

Other effects

Cardiac arrhythmias were encountered in only two patients in this series. In both cases, the arrhythmia was of short duration and was corrected when an abundant supply of oxygen was administered. It was the opinion that these two were caused by a lack of oxygen.

Hypotension: No severe fall in blood pressure occurred during this series. The average fall in systolic pressure was between 10 to 20 mm. of mercury. No severe bradycardia or tachycardia has been observed up to this time.

Respiratory alterations: After the initial induction dose of Surital Sodium, the depth of respirations almost invariably diminished, but the rate per minute remained the same. While respiratory exchange did diminish appreciably, depending upon the depth of the anesthesia, the diminution was not felt to be as great as with Pentothal Sodium. The respiratory depression caused by Surital Sodium showed predominantly a decrease in volume exchange rather than in rate.

Apnea was encountered in only a few cases. This was due to the slow, cautious technique used in administration, and discontinuing temporarily the agent short of causing respiratory arrest. When apnea did occur, it was corrected both by discontinuing the drug and by applying intermittent positive pressure oxygen from the rebreathing bag of the gas machine.

Laryngospasm: No severe case of laryngospasm resulted. When this complication did occur, it was more benign and less frequent than that associated with the other intravenous barbiturates.

Phlebitis or vein irritation: This complication was not met with, owing to the fact that a solution no stronger than 2.5 per cent was used.

Postanesthetic complications: There were no deaths or postanesthetic complications attributable to this agent or to the anesthetic procedures used.

Conclusions

This clinical trial in 747 cases indicates that Surital Sodium does not fulfill all the requirements of an ideal anesthetic. In certain respects, however, it is superior to the other barbiturates. The following advantages have been observed.

1. Recovery was more rapid than with other agents.
2. There was less circulatory depression.
3. Respiratory depression was less marked.

4. Laryngospasm occurred less frequently and was not as severe or prolonged as with other anesthetics.
5. Excessive hypotension was not encountered, the blood pressure falling no more than 20 mm. of mercury, systolic.
6. Cardiac arrhythmia occurred in only two cases, both of which were of short duration and were corrected when anoxemia was eliminated.
7. There were no deaths or postanesthetic complications.

The advantages and disadvantages of Sodium Surital as observed in this series lead to the conclusion that this intravenous agent is entitled to further clinical trial.

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EXPERIENCE WITH THE MALE NORTH AMERICAN FROG TEST

W. M. SMETHIE, M.D.

WADESBORO

The need for a simple, reliable, and rapid pregnancy test, available in any hospital laboratory, is obvious. The purpose of this paper is to offer for analysis our experience with the Male North American frog test, in a small community hospital, and to invite the experience of others.

The work presented is not original, but is simply the application of the procedure described by Robbins and his associates[1]. Various slight modifications as described by other investigators have been utilized, notably Cutler's concentration of urine inoculum and method of keeping the test Amphibia[2].

The test may be relied upon as soon as ten to fifteen days after the first missed period. It may done even earlier, but if the results are negative, it should be repeated after the prescribed interval has elapsed.

Technique

The following materials and equipment are needed:

Live male frogs (*Rana pipiens* or *Rana clamitans*)
Covered glass food dish (5 by 8 inch size accommodates a dozen frogs)
Refrigerator—kept at 4 to 6 C. for storing frogs
Syringe and needles
5 ml. pipette
Centrifuge
Microscope
100 ml. graduated cylinder
Urinometer
Bromcresol green (Indicator solution: 0.04 per cent)
Hydrochloride acid (20 per cent solution)
Phenolphthalein (0.5 solution)
Sodium hydroxide (0.1 normal solution)
Kaolin, acid washed powder

Two and one-half ml. from a 3 to 4 ounce sample of first morning-voided urine are injected into the dorsal lymph sac of the frog, which is then placed in a covered, dry glass container (600 ml. beaker). After thirty minutes the frog is removed and its cloaca is brought into contact with a glass slide, the frog being compressed to make it void. The slide is then examined under the microscope for the characteristic sperm cells. If these are present, the test is reported positive and no further procedure is necessary. If no sperm cells are present, the Scott concentration procedure described in Cutler's paper[2] is begun.

If the first frog continues to give a negative reaction after the concentration is complete, 1 ml. of the concentrated inoculum is injected into the dorsal lymph sac of a second frog, and its urine is examined at thirty minute intervals. If at the end of three hours from the time of the injection no sperm have been produced from either frog, the test is reported negative. Occasionally, the 2.5 ml. of whole urine kills the frog, but this does not happen with the concentrated inoculum.

Interpretation of the test offers no difficulty. The sperm, when present, are plentiful and easily recognizable, resembling nothing else seen in urine.

Precautions: We do not use frogs a second time; we do not depend on frogs which have been in our storage longer than three weeks. We frequently check frogs giving a negative reaction by injecting the dorsal lymph sac

with 1 ml. of known positive inoculum, which can be kept frozen in the refrigerator indefinitely. There is always an ample supply left over from previous positive tests.

The use of two frogs in each test virtually eliminates the possibility of a false result from using a female frog by mistake. Although sex-distinguishing features of *Rana pipiens* are very slight, so far as we know, we have received only one female frog from our supplier.

Results

Up to the present a total of 221 tests have been performed. Of these, 31 were done with specimens of urine from women known to be pregnant. Five of the patients had advanced beyond the seventh month of pregnancy. (Some workers have reported a high incidence of false negative results after the second trimester.) Specimens from women known to be nonpregnant were used in six of the tests, all correctly negative.

The remaining 184 tests were done as a laboratory aid in diagnosis. Follow-up was sufficient in 187 of the patients to confirm or deny the results.

Total results are as follows:

Correct tests (confirmed)	184
False negative tests	2*
False positive tests	1†
Percent. of accuracy	97.86
Percent. of accuracy by Robbins *et al*[1]	96.0
Percent. of accuracy by Carlos Galli Mainini[3] (S. American frogs)	99.7

Comment

If this test can be shown to be as reliable as other animal tests (which some say has already been done), it offers rather great advantages. The first is that it can be performed with the facilities of any hospital laboratory and of many office laboratories. The equipment and reagents are few and simple. Second is the speed of the test. The maximum time required to obtain a negative report is three and one-half to four hours, while a positive report is often available within fifteen to thirty minutes. This factor may be of considerable importance in solving diagnostic problems, such as a differential diagnosis in ectopic pregnancy. The third advantage is the extremely low cost, both actual and relative. Fourth is the conclusiveness of the reaction. No long search to determine the presence of spermatozoa is required.

We have found the procedure particularly useful in:

1. Patients who have passed hydaditiform mole.

We have had 4 of these to date. All have remained free of hormone.

2. Patients who have some contraindication to pregnancy.

Examples: One patient with arrested tuberculosis had undergone thoracoplasty and Pomroy sterilization. Her physician requested the test after she had missed two periods. The result was negative. In a second patient, cancer of the breast developed during lactation. She underwent radical mastectomy. Two weeks later she missed her second period. The frog test confirmed pregnancy.

Summary

Experience with the male frog pregnancy test has been presented. In my judgment, it is a reliable, rapid, simple, economical and valuable aid. It can be performed with the laboratory facilities of any hospital.

The author's grateful appreciation is extended to Mrs. Irene Blue for her untiring technical assistance.

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* One of the false negative results was proved to be due to a missed abortion. Since no hormone was present, the reaction was normal. In the other case, a second test given after the patient had missed her second period was positive.

† I cannot explain the false positive result, which was reported to me by the patient about a year later. A test done at this time was negative. The patient denied the possibility of a miscarriage. On pelvic examination a moderately tender mass, taken to be tubo-ovarian, could be felt in the cul-de-sac. She was advised to have an operation, but has not returned here. Whether this woman had a tubal abortion which she took care of herself is cause for conjecture.

Causes of Fear Among Obstetric Patients—Over the years I have seen no instance in which an unsuccessfully attempted abortion has been followed by the birth of a physically abnormal or deformed child. Many of the resultant children are now adults, and in them I have noted no mental abnormalities which might not much more appropriately be attributed to their inherited familial genes and chromosomes. Certainly there has been no congenital absence of gray matter due to the unsuccessful outcome of an attempt to produce an abortion. A kind heart, an understanding experience and something approaching at least a speaking acquaintanceship with the Almighty will be needed to guide one in answering these unexpressed but momentous questions of spiritual guilt.—Bloss, J. R.: Causes of Fear in Obstetric Patients, J.A.M.A. 144: 1359 (Dec.) 1950.

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"The prime object of the medical profession is to render service to humanity; reward or financial gain is a subordinate consideration. Whoever chooses this profession assumes the obligation to conduct himself in accord with its ideals."—Principles of Medical Ethics of the American Medical Association, Chapter 1, Section 1.

OCTOBER, 1951

THE INCREASING IMPORTANCE OF THE ANESTHETIST

The two papers in this issue from the Departments of Anesthesia of Duke and of Bowman Gray, and the three papers on anesthesia in the June issue, are concrete evidence of the increasing importance of the professional anesthetist. Part of Dr. Alfred T. Hamilton's paper was purposely omitted when it was published in the June issue, so that it might be used as the basis of this editorial. With his permission, it is now reproduced in part, as a guest editorial.

* * *

Few surgeons would abandon the pre- and postoperative management of their patients. At the same time, few surgeons would deny the value of consultation, not only in reference to the desirable anesthetic agent but concerning preoperative medication and preparation. The immediate postoperative period is often not attended by the operating surgeon because his presence is required elsewhere, and certainly the short period of recovery carries, in general, the highest incidence of preventable anesthetic mortality. It certainly helps a surgeon on his *next* case to know that the *preceding* patient is regaining consciousness with an adequate airway and with the provision of necessary drug and fluid support. Later on, the attendance of the anesthetist upon the patient often eases the surgeon's burden, and no doubt adds to the patient's safety, in such conditions as postoperative atelectasis and pneumonia.

Two fields of general surgery revolutionized by specialized anesthesia concern the neck and the abdomen. In the former, prerequisites to good modern surgery are a constantly satisfactory airway with high oxygen tension. There can be no comparison between the satisfaction of operating when a dexterously inserted intratracheal tube is employed, on the one hand, and under local or ordinary inhalation anesthesia, on the other. Pre- and post-operative visualization of vocal cord function is an incidental but important benefit to tracheal intubation. In extensive procedures involving the neck, chest, and abdomen, so frequently seen during the late war, endotracheal anesthesia with positive pulmonary pressure and complete abdominal relaxation is necessary to a successful outcome.

Those surgeons who have a special preference for spinal anesthesia are particularly helped by the professional anesthetist. Sise's hyperbaric pontocaine, Lemmon's continuous spinal, and saddle anesthesias can best be controlled by one not concerned with the operation itself.

Few professional men are in such widespread demand by their confreres. The anesthetist may be useful to the internist, the surgeon, and the obstetrician.

The anesthetist, as a medical specialist with advanced professional training and certification, desires the privileges of his profession, including freedom of action and freedom from economic competition with the hospital. He wants his individual patient

billed for the anesthetic only once and that once by the anesthetist. He wants the patient's physician who calls him to explain such a charge to the patient. He wants the insurance companies to take benefits for medical services of all sorts, out of Blue Cross hospitalization contracts and put them in Blue Shield where they rightfully belong.

—A.T.H.

* * *

THE TIME ELEMENT IN MEDICINE

Much has been said and written about the importance of "timing" in military and political affairs. The time element is just as important in medicine, both in diagnosis and treatment. One of the worst habits a doctor can form is that of making "snap" diagnoses of his patient, without waiting until he has obtained all the evidence possible. In a full blown case of measles or chicken pox or herpes zoster, it is quite easy and even desirable to "pronounce" the disease, as the layman used to say; but in a patient with obscure abdominal symptoms or a persistent fever, several days of careful questioning and physical examination, supplemented by technical aids, are usually necessary for an accurate diagnosis and proper treatment.

An excellent example of the importance of the time element in diagnosis is the average myocardial infarction. Only too many textbooks describe this condition as characterized by substernal pain, a precipitate fall in blood pressure, fever, leukocytosis, an increased sedimentation rate, a pericardial friction rub, and electrocardiographic changes.

The impression may be left on the mind of the student—and may persist for some years in practice—that the blood pressure falls, the temperature rises, the number of white blood cells and the sedimentation rate both increase, and electrocardiographic changes develop almost immediately after the onset of the pain. It is generally recognized that the friction rub is much less constant, and is much oftener absent than present.

To have this picture in mind as typical of a myocardial infarction is to miss many diagnoses. Except in massive infarctions the blood pressure is more often elevated for the first few hours—perhaps for twenty-four to thirty-six—before it begins to fall. The temperature seldom rises until at least twelve, and oftener twenty-four to thirty-six, hours have elapsed. Leukocytosis comes on early, within a few hours, but the sedimentation rate seldom rises for at least twenty-four and often forty-eight hours. It persists for days or even weeks, while the leukocyte count returns to normal in the uncomplicated case within two or three days. The friction rub is to be heard in only one of every four or five cases, and may disappear within a few hours. Finally, the electrocardiographic changes may not appear for a day or two—sometimes four or five.

The clinician who looks upon a coronary occlusion as a sort of evolutionary process, which takes from one to three days to unfold, and who does not allow anxious and excitable relatives to prod him into an immediate answer to the question, "What's the matter, doctor?" will not be embarrassed nearly so often as if he attempts to label every pain in the chest and upper portion of the abdomen within ten minutes after he walks into the sick room.

The time element is of inestimable importance when when one is dealing with psychosomatic or psychoneurotic complaints. There is absolutely no substitute for time in taking the history of a patient whose symptoms are wholly or partly functional. Such patients can not be made to tell the most relevant part of their story to a doctor who is obviously impatient and anxious to get to the next case. In the long run, furthermore, time will be saved by giving such a patient ample time at the first interview to get a complete history, which need not be repeated on later visits. Much more can be learned from a single interview of an hour than from a dozen fifteen-minute sessions; and giving the patient an opportunity to unburden himself —or herself—is an important part of the therapy.

There are numerous other ways in which the element of time enters into the diagnosis, prognosis, and treatment of disease; but the time customarily allotted for reading an editorial suggests that these be reserved for a possible future paper on the subject.

* * *

WARTIME WASTAGE OF MEDICAL MANPOWER

It is accepted as axiomatic that war is wasteful; but much of its waste might be prevented by intelligent planning. One of the most appalling wastes in World War II was medical manpower. Thought is being given now to a more economical use of medical men in the present planning for mobilization.

That Great Britain has been also extravagant with its medical manpower is apparent in the Supplement to the *British Medical Journal* for August 18, which is quoted in part:

> "The Central Medical War Committee is once again compiling a register of the profession. The recollection of most of us is that we put our names on this register, which was combed and combed again to supply doctors for the three armed Services. The three Directors-General competed with each other for the greatest number of doctors, and an appalling wastage of medical men resulted. The medical press was full of bitter complaint from those who had put their names and capabilities on the register and had been handed over to the insatiable armed Forces to live in enforced idleness thereafter."

The writer — Dr. Kenneth S. Mullard — proposes that the three medical branches of the armed forces be merged into one, and that arrangements be made for free transfer from military to civilian life, and vice versa, as the needs of war require.

It is interesting that Britain has had—and still has—the same problems, the same complaints, and the same solutions proposed that the United States has had—and still has.

* * *

WATER CASTING UP TO DATE

Once upon a time, many years ago, certain physicians gained considerable fame as a result of their supposed ability to diagnose and treat disease by examining the urine. They were known as "water casters."

According to Webster, this term is now obsolete; but it should be revived to apply to an outfit practicing in Chicago under the name of the National Bureau of Analysis. According to a letter sent to a prominent business man: "Periodical examinations of the urine will enable you to detect trouble in the body far in advance of the time when aches, pains or indigestion send you to your physician only to find out the disease is well established . . . you cannot buy health once it is lost but you may preserve it for many useful years by watching the danger signals which appear in the urine."

A circular accompanying the letter states that "periodical urinalysis is your protection against diseases that give no warning." In order to safeguard the health of our big business and professional men, the National Bureau of Analysis offers its "Quarterly Stay-Well Service" for the ridiculously low price of $15. Every three months the Bureau will send the subscriber a stamped and addressed container. An analysis of the urine, "both chemical and microscopic," is made, and "the findings are passed on to our Laboratory Director who compares them with all previous reports of your case, checks symptoms and gives you his unbiased opinion in a personally dictated letter," mailed "in an envelope marked 'Personal.' "

In a sample report to the hypothetical John Doe, it is noted that the reaction is "sharply acid" and that there is a trace of sugar, although the acetone is reported as "normal." Mr. Doe is told that the report is less favorable than the preceding one, and the Laboratory Director warns him that he is eating too much and has overindulged in sweets or starches. Mr. Doe is advised to "eat less of the heavier foods, such as meats, eggs, potatoes . . . substituting fresh vegetables and fruits . . . If you follow these instructions an improvement should be noted in your next report."

One wonders just what is meant by "sharply acid." The quality of sharpness suggest that the urine was tasted. If so, the price of $3.75 per urinalysis may be justified.

One wonders, too, just where the Laboratory Director learned that meats and eggs should be reduced in an anti-diabetic diet, and that "fresh vegetables and fruits" may be eaten without taking thought of their carbohydrate content.

Listed among the long-time members of the National Bureau of Analysis are S. L. Avery, chairman of the Board, Montgomery Ward and Company; Clarence M. Brown, ditto of the Pittsburgh Plate Glass Company; M. S. Eccles, of the Federal Reserve Bank; United States Senator Robert S. Kerr —and others who should know better, but who are living proof of the truth of Barnum's observation that the people like to be humbugged.

CORRESPONDENCE

To the Editor:

The purpose of this letter is to acquaint you with the present procedures whereby eligible civilian physicians may request an appointment in the Regular Navy, and to solicit your cooperation in an effort to secure wide publicity of this matter in the State of North Carolina.

Civilian physicians with no present service affiliation and who did *not* participate in the Army Specialized Training Program (ASTP) desiring commissions in the Regular Navy should apply to the Office of Naval Officer Procurement, 1400 Pennsylvania Avenue, Washington, D. C.

It is no longer necessary for the young physician completing his internship to be ordered to appear for written professional examination and to await action thereon before appointment may be effected. Those serving in internship may submit their applications within two months of completion date, but appointments will not be issued until they have satisfactorily completed internship.

Your interest and cooperation in this matter are appreciated.

Sincerely,

J. B. LOGUE
Rear Admiral (MC) USN
District Medical Officer

* * *

To the Editor:

The medical staff of the Central Carolina Convalescent Hospital, in Greensboro, is anxious to acquaint the physicians of North Carolina with some pertinent information concerning our hospital and its functions.

Our hospital is unique, in that it was established on an emergency basis, due to the fact that in 1948 the doctors of Greensboro and the surrounding areas found an epidemic of polio right on our front doorsteps. Facilities for treating polio patients were inadequate, and the need was great. Through the combined efforts of public appeals for labor and financial aid, along with the advice and trained personnel from the National Foundation for Infantile Paralysis, the doctors of Greensboro shouldered the task of treating patients from a large epidemic area in a hospital built specifically for the medical care of acute and convalescent cases of poliomyelitis, with a staff of specialized nurses, physiotherapists and aides. There are no house or resident doctors. The practicing doctors of Greensboro compose the medical staff.

When the epidemic ended we had a rather small group of local patients receiving convalescent care. Because we had the facilities and trained personnel with us, we agreed to treat patients from other areas, as long as our beds held out, and as long as first-rate physical therapy for convalescent patients could be given. We have, therefore, continued to receive patients from all over North Carolina, neighboring Southern States and on some occasions, from distant regions.

At times, however, through misunderstanding of the nature of the facilities available at the Central Carolina Convalescent Hospital, serious problems in regard to transportation and admission of patients have developed. We are not equipped as a diagnostic center, although frequently we have had to assume that function. Seriously ill patients have been sent long distances to the hospital, because of an erroneous diagnosis of poliomyelitis, or because of suspected poliomyelitis which had not been confirmed by either consultation with a specialist or by laboratory studies. These patients have had to suffer the return trip home, because we are equipped to treat only polio patients.

We feel that when patients are to be transported to the Central Carolina Convalescent Hospital it is to the patient's advantage for the referring physician to speak personally with either the nursing supervisor on duty at the hospital, or to the physician who will treat the case on arrival. Seriously ill polio patients should not be started on a long journey without adequate facilities for emergency care en route. It must be remembered that the tiring effort of a long journey can change the condition of a patient from "good" or "fair" on departure to "critical" on arrival. If facilities for treating respiratory and bulbar and encephalitic patients are not available where the diagnosis has been made, then those facilities should be found as nearby as possible. Asheville, Charlotte, Durham, Raleigh, Winston-Salem, and Wilmington should be able to serve the state as emergency care centers as well as diagnostic centers. Specialists for consultation and laboratory facilities are available in these cities, and this should make unneces-

sary the transportation of critically ill patients over long distances to the hospital in Greensboro.

We are extremely thankful that our state has been spared an epidemic of any major proportions during the past two years, and we are glad that we are able to maintain the Central Carolina Convalescent Hospital as a service to those who seek treatment for either acute or convalescent poliomyelitis. We are proud to offer our facilities and the services of our specially trained personnel just as long as we have beds and as long as we have poliomyelitis with us.

Sincerely yours,

EDWARD P. BENBOW, JR., M.D.
for the Medical Staff of the
Central Carolina Convalescent Hospital

Acthar Price Drop and Long-Acting Form Cuts Cost of Treatment

Two developments which will greatly lower the cost of treatment with ACTH and bring added convenience to the user were announced recently by F. W. Specht, president of Armour and Company.

First, Mr. Specht said, the price of Acthar, The Armour Laboratories brand of ACTH, is being reduced an average of 25 per cent. The new price means a saving of five to eight dollars per day to the patient in the treatment of certain diseases.

Second, he said, The Laboratories have developed a long-acting form of the drug, known as Acthar Gel. Acthar Gel after initial treatment need be injected only once every one to three days, in contrast to as many as four injections a day of Acthar powder in solution, as used hitherto, with the consequent saving of time, money and discomfort.

Since Acthar was first used successfully in treating human diseases, it has been found that relatively small quantities will work in many cases. Some arthritis patients are able eventually to get along with a maintenance dose once every few days!

The new Acthar Gel will sell at the same price per unit as Acthar powder. It will not replace Acthar powder because the latter has advantages in certain diseases where rapid action is needed.

Dr. Thompson Appointed Associate Medical Director

Dr. Eugene J. Thompson has been appointed associate medical director of Winthrop-Stearns, Inc., it was announced by Dr. Justus B. Rice, medical research director.

Dr. Thompson will work in the department of medical research, which is concerned with clinical investigation of new pharmaceuticals. He will also assist in the training of the company's professional service representatives.

Prior to joining Winthrop-Stearns, Dr. Thompson interned at Boston City Hospital. He received his M.D. from Boston University School of Medicine. He took his B.S. degree at the College of the City of New York.

During World War II he served for several years in the air force as an aerial navigator and instructor in charge of radio navigation.

BULLETIN BOARD

NEWS NOTES OF THE BOWMAN GRAY SCHOOL OF MEDICINE OF WAKE FOREST COLLEGE

During the month of September, 1951, the Bowman Gray School of Medicine of Wake Forest College celebrated its tenth anniversary.

The Bowman Gray School of Medicine is an expansion of the Wake Forest College two year medical school located at Wake Forest College, Wake Forest, North Carolina, from 1902 until 1941. The name was changed on the opening in Winston-Salem from the Wake Forest College School of Medical Sciences to the Bowman Gray School of Medicine of Wake Forest College, in recognition of the benefactor who made the expansion possible, the late Bowman Gray of Winston-Salem.

The original move of the medical school to Winston-Salem was made possible through the will of the late Bowman Gray. On August 4, 1939, the resources of the Bowman Gray Foundation were made available to the Wake Forest College School of Medical Sciences, with the provision that the institution be relocated in Winston-Salem. Since the removal of the school in 1941, the members of the Gray family have continued in their interest and support of the institution. Included in their gifts is Graylyn, the Bowman Gray estate of one hundred acres, which is now being used by the Department of Neuropsychiatry for a hospital and clinics.

The trustees of the Smith Reynolds Foundation have made available resources to Wake Forest College, making it possible to relocate the college in Winston-Salem, thus establishing a complete university in Winston-Salem. Ground-breaking exercises for the college were held on October 15.

The Bowman Gray School of Medicine of Wake Forest College and its teaching hospital, the North Carolina Baptist Hospital, are institutions of the Baptist State Convention of North Carolina. The hospital was opened in 1923, with eighty-four beds, and was expanded in 1941 to a 300 bed hospital. Contracts have been let for an added 150 bed wing, scheduled in late 1952.

When the medical school opened in Winston-Salem on September 10, 1941, it had a student body of seventy-three. This year the student body will number 188. Fifty-six freshmen, who were selected from 860 applicants, were admitted on October 1, 1951. During the ten year period of 1941 to 1951, approximately seven thousand applications for admission have been considered. In the nine graduating classes, 383 candidates have received the degree of Doctor of Medicine.

During the course of the tenth year celebration in September, Dr. Coy C. Carpenter, Dean of the Bowman Gray School of Medicine of Wake Forest College, was honored by the faculty of the institution. Dr. Carpenter was appointed dean of the two year medical school at Wake Forest College in 1936, and continued in that capacity with the removal of the school. The year 1951, therefore, marks his fifteenth year as dean of the institution. In recognition of Dr. Carpenter's service, the faculty has had painted a portrait of Dr. Carpenter, which will hang in the lobby of the institution. In further recognition, the faculty has established the Coy C. Carpenter Emergency Student Loan Fund, for the benefit of students enrolled in the institution.

Other phases of the program carried out during the month of September commemorating the tenth anniversary of the medical school included the ground-breaking exercises for the new wing of the North Carolina Baptist Hospital, the teaching hospital of the medical school. A public banquet was

held on September 27, 1951, at which time Mr. John M. Russell, Executive Director of the John and Mary R. Markle Foundation, was the principal speaker, in further recognition of the contributions of the institution to community health and welfare, and to medical education.

News Notes from the University of North Carolina School of Medicine

Postgraduate medical courses sponsored by the University School of Medicine and the Extension Division are being held at Morganton, with the Burke County Medical Society as co-sponsor, and at Goldsboro, with the Wayne County Medical Society as co-sponsor. The programs are as follows:

Morganton

OCTOBER 3

4:00 p.m.—Functional Uterine Bleeding
7:30 p.m.—Hysterectomy: Indications and Contraindications—Dr. H. Hudnall Ware, Jr., Medical College of Virginia

OCTOBER 10

4:00 p.m.—Management of Some Disorders of Cardiac Rhythm
7:30 p.m.—Treatment of the Failing Heart—Dr. Harry Gold, Cornell University Medical School

OCTOBER 17

4:00 p.m.—Means of Diagnosis and Management of Certain Major Microbial Diseases
7:30 p.m.—Treatment and Diagnosis of Diseases Caused by Rickettsiae and Certain Viruses: Discussion of the Pulmonary Manifestations of Certain Microbial Diseases — Dr. Theodore E. Woodward, University of Maryland

OCTOBER 24

4:00 p.m.—Office Dermatology
7:30 p.m.—Management of Common Skin Diseases —Dr. Herman Beerman, University of Pennsylvania

OCTOBER 31

4:00 p.m.—Rapid Review of Recent Developments in Pediatrics
7:30 p.m.—Feeding Problems in Infants and Children—Dr. Samuel F. Ravenel, Greensboro

NOVEMBER 7

4:00 p.m.—Fractures of the Elbow
7:30 p.m.—Indications for Amputation and Rehabilitation of Amputees—Dr. T. Campbell Thompson, Columbia University College of Physicians and Surgeons

Goldsboro

OCTOBER 4

4:00 p.m.—Functional Uterine Bleeding
7:30 p.m.—Hysterectomy: Indications and Contraindications—Dr. H. Hudnall Ware, Jr., Medical College of Virginia

OCTOBER 11

4:00 p.m.—Management of Some Disorders of Cardiac Rhythm
7:30 p.m.—Treatment of the Failing Heart—Dr. Harry Gold, Cornell University Medical School

OCTOBER 18

4:00 p.m.—Means of Diagnosis and Management of Certain Major Microbial Diseases
7:30 p.m.—Treatment and Diagnosis of Diseases Caused by Rickettsiae and Certain Viruses: Discussion of the Pulmonary Manifestations of Certain Microbial Diseases — Dr. Theodore E. Woodward, University of Maryland

OCTOBER 25

4:00 p.m.—Office Dermatology
7:30 p.m.—Management of Common Skin Diseases —Dr. Herman Beerman, University of Pennsylvania

NOVEMBER 1

4:00 p.m.—Changing Trends in Abdominal Surgery
7:30 p.m.—The Treatment of Diseases of the Thyroid Gland — Dr. George Crile, Jr., Cleveland Clinic Foundation

NOVEMBER 8

4:00 p.m. Fractures of the Elbow
7:30 p.m. Indications for Amputation and Rehabilitation of Amputees—Dr. T. Campbell Thompson, Columbia University College of Physicians and Surgeons

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Dr. Charles Bruce Taylor joined the faculty at Chapel Hill in September as associate professor of pathology. He has held teaching appointments at the University of Minnesota and at the University of Illinois, and for the past several years has been associate attending pathologist at the Presbyterian Hospital in Chicago.

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Dr. Basil Lionel Truscott has been appointed assistant professor in anatomy. Dr. Truscott received his Ph.D. and M.D. degrees from Yale University, and has held teaching appointments at the Georgetown University Medical School and at Yale University.

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Dr. J. Logan Irvin, of the department of biological chemistry, was recently appointed research consultant with the Atomic Energy Commission at the Oak Ridge Institute of Nuclear Studies.

News Notes from Duke University School of Medicine

A Japanese translation of a medical book by Dr. Wilburt C. Davison, dean of the Duke University Medical School, is soon to be published in Japan, it was announced recently.

Dr. Davison's book **The Compleat Pediatrician**, already in its sixth American edition, has become a classic in the field of pediatrics since its first publication in 1934. Translators of the Japanese edition are Dr. Shizuo Morishige and his associates Drs. Shigenobu Kuriyama, Sennosuke Shizume, and Tumio Saito. It is being published by Mr. K. Inoue of the Nihonshoniijishuppansha in the Wakodo Company.

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Two changes have been made in the Duke series of autumn lectures announced last month. Dr. Isaac Bigger, professor of surgery, Medical College of Virginia, will lecture on October 27, while Dr. Herman E. Pearse, professor of surgery, University of Rochester, will speak on November 10. This change was necessitated by a conflict in speaking engagements. The subjects of the two men will remain the same, Dr. Bigger speaking on "The Complications and Treatment of Pulmonary Cysts and Emphysematous Blebs and Bullae," and Dr. Pearse on "Medical Effects of the A-Bomb."

North Carolina State Board of Health

A call to arms against diphtheria has been sounded by Dr. J. W. R. Norton, State Health Officer, who, in a statement just issued, disclosed that North Carolina led the entire nation in the rate of cases reported for every 100,000 people in 1950. He cited figures recently released by the United States Public Health Service, showing that, last year, the case rate here was 12.4, as compared with a national rate of 3.9.

"This report," Dr. Norton said, "is a disgrace to North Carolina and should arouse the entire citizenship to action, if we mean to do our duty toward our infants and small children. Nothing but all-out war will suffice, and I am calling on our local health departments throughout the state to close ranks and attack diphtheria with every means at their command. I am asking that they step up the campaign for immunization until complete victory is achieved.

"The request that is being made of our local health departments is made of every citizen of the state, especially parents, guardians, and prospective parents. The time for positive action is now—not next month; not next week, but today. It is highly probable that the seriousness of the situation is known to but few people—those who have occasion to read U.S.P.H.S. reports, such as that from which the figures I have quoted were taken. Among all the forty-eight states in the Union, ten had a case rate last year of one, or less, as compared with North Carolina's 12.4.

"All children over three months of age should be immunized against diphtheria, whooping cough, and tetanus. All children under seven years of age who previously have been immunized should receive booster doses. Both whooping cough and diphtheria can be eliminated almost completely, if parents and guardians will cooperate. The immunizations for diphtheria and whooping cough can be combined with that for tetanus (lockjaw) so that all can be prevented at once. The reactions from injections are mild, and it seems that the effectiveness of each is enhanced by being given in combination with the others."

North Carolina League for Crippled Children

Plans are being completed for the annual meeting of the North Carolina League for Crippled Children to be held at the Hotel Sir Walter, in Raleigh, on November 29. D. Hiden Ramsey of Asheville, president of the League, will address the opening session of the conference on the subject, "The State's Duty to Its Handicapped Children." Other speakers will be distinguished leaders from the National Society of Crippled Children and Adults, specialists in the treatment and training of the handicapped.

* * *

Dr. Landis S. Bennett of Raleigh has been appointed a trustee of the National Society for Crippled Children and Adults, as the representative of the North Carolina League for Crippled Children.

Dr. Bennett was born in Jackson Springs, North Carolina, and was graduated from North Carolina State College in 1930. He received his Ph.D. degree at the University of West Virginia and returned to North Carolina State College in 1940. He is now the head of the department of visual aids in the School of Agriculture.

Dr. Bennett attended the national convention of the Society of Crippled Children and Adults which was held in Chicago, Illinois, October 3-6.

North Carolina Tuberculosis Association

Executive Committee Refuses Forsyth Request

The Executive Committee of the North Carolina Tuberculosis Association in a special session at the State Office August 21 refused a request to allow its Forsyth County affiliate to participate in the Winston-Salem United Fund, a move which would eliminate the annual Tuberculosis Christmas Seal Sale.

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Nelson W. Stephenson, field secretary and publicity director of the North Carolina Tuberculosis Association for the past three years resigned recently to become consultant on community services with the North Carolina Board of Public Welfare. He will be succeeded by Hodson DeHaven Chinnis of Richmond, Virginia, a 1951 graduate of the University of North Carolina.

Another newcomer to the staff, but not to North Carolina, is Norman C. Gaskill of Goldsboro, North Carolina. Mr. Gaskill, who holds a M.S.P.H. degree from the University of North Carolina, was formerly Health Educator with the Wayne County Health Department. He replaces A. James Thomas who has been awarded a fellowship by the National Tuberculosis Association for a year's study at Wayne University in Detroit, Michigan.

American College of Chest Physicians North Carolina Chapter

The annual meeting of the North Carolina Chapter of the American College of Chest Physicians on October 31, 1951, will include an afternoon session beginning at 2:00 p.m. at the Veterans Administration Hospital, Oteen, and an evening session beginning at 8:00 p.m. at the Battery Park Hotel, Asheville. There will be a social hour and dinner at 6:30 p.m. at the Battery Park Hotel.

The following program has been arranged:

Case of Cardiac Arrest During Thoracic Surgery: Pathologic Report—Dr. Leo L. Leveridge, Oteen.

Pulmonary Tuberculosis and Pregnancy—Dr. C. D. Thomas, Black Mountain.

Streptomycin Treatment for Tension Cavity—Dr. Ralph E. Moyer, Oteen.

Some Observations on the Pathogenesis and Healing of Tuberculous Cavities—Dr. Benjamin Sandler, Oteen.

Benign Intrathoracic Lesions—Dr. V. K. Hart, Charlotte.

The Management of Symptomless Intrathoracic Lesions—Dr. Paul W. Sanger, Charlotte.

Movie picture session: 1. Traumatic Stricture of Right Main Bronchus; Empyema in a 14 Month Old Baby; Esophageal Fistula—Dr. Julian A. Moore, Asheville. 2. Excision of Giant Pulmonary Cyst; Excision of Mediastinal Tumor — Dr. James D. Murphy, Oteen.

North Carolina Surgical Association

The North Carolina Surgical Association had its meeting September 22, at Graystone Inn at Roaring Gap. The following program was given:

Dr. Felda Hightower presented "Diaphragmatic Hernia," Dr. Watts Farthing presented "Mesenteric Cysts," and Dr. Max Schiebel presented the "Treatment of Chronic Ulcerative Colitis."

The annual election of officers was held, and Dr. Donald Koonce of Wilmington was elected president, Dr. Gordon Sinclair of Raleigh, vice president, and Dr. Alex Webb, Jr., of Raleigh, secretary and treasurer.

Postgraduate Course in Cardiac Diseases

A postgraduate course in cardiovascular diseases for rural practitioners was held at the Bowman Gray School of Medicine of Wake Forest College, September 25-27, under the sponsorship of the National Heart Institute, in cooperation with the North Carolina State Board of Health. Dr. Robert L. McMillan, of the Bowman Gray Medical School, was director of the course, which was attended by a selected group of physicians from North Carolina communities of less than 10,000 population.

The program was designed to correlate the various aspects of cardiac disease with the problems of the general practitioner. The faculty was drawn from the faculty of the Bowman Gray School of Medicine, each speaker relating the general subject to his particular specialty. In addition to the individual papers, the program included a clinicopathologic conference, a patient demonstration and work shop, a symposium, and numerous round table discussions.

A similar course will be offered March 25, 26, and 27. Applications for scholarships should be made to Dr. A. H. Elliott, Assistant Health Officer, North Carolina State Board of Health, Raleigh, North Carolina.

Mecklenburg County Medical Society

The Mecklenburg County Medical Society will again present the Heineman Lectures this fall. The entire program will be held at the Hotel Charlotte in the Rose Room.

There is no registration fee and physicians are cordially invited to attend and to bring any in allied sciences who may be interested in these talks.

The following meetings have been scheduled:

Friday, October 19, 1951, 8:00 p.m.

Dr. Sara M. Jordan, Lahey Clinic, Boston; Dr. Samuel F. Marshall, Lahey Clinic, Boston — "Lesions of the Upper Gastrointestinal Tract—Treatment: Medical and Surgical"

Friday, October 26, 1951, 8:00 p.m.

Dr. Jefferson Browder, Long Island Hospital, New York—"Surgical Management of Intractable Pain"

Dr. Howard Ulfelder, Massachusetts General Hospital, Boston—"Principles in the Diagnosis and Treatment of Carcinoma of the Cervix and Uterus"

Friday, November 2, 1951, 2:00 p.m.

Symposium: "The Application of Basic Sciences to Clinical Practice"

Dr. Richard L. Riley, Johns Hopkins University, Baltimore — "Fundamentals of Cardio-Pulmonary Physiology"

Dr. Monroe Romansky, George Washington University, Washington—"Principles of Antibiotic Activity and the Choice of Antibiotic Agents in Therapy"

Dr. Armand J. Quick, Marquette University, Milwaukee—"The Blood Clotting Mechanisms; the Diagnosis and Treatment of Disturbances of Hemostasis"

Commander John L. Tullis, Bethesda, Maryland —"The Pathology of Radiation Injury; Therapeutic Implications"

Friday, November 2, 1951, 8:00 p.m.

Discussion Panel: Moderator, Dr. Joseph C. Aub, Massachusetts General Hospital, Boston

Eighth District Medical Society

The Eighth District Medical Society met at the Robert E. Lee Hotel in Winston-Salem on October 18. The afternoon session was devoted to a scientific program consisting of the following papers: Skin Cancer—Dr. George W. James; Headaches: Practical Suggestions as to Diagnosis and Treatment—Dr. V. W. Taylor, Jr.; The Management of Defects of the Common Bile Duct—Dr. Richard T. Myers; The Challenge of Rocky Mountain Fever—Dr. Samuel F. Ravenel; Diagnosis and Treatment of Urinary Tract Infections—Dr. Fred K. Garvey.

A dinner was held at 7:00 p.m., at which time Dr. I. G. Greer was the speaker.

Ninth District Medical Society

The Ninth District Medical Society held a meeting at the Hickory Country Club on September 27, at which the following scientific program was presented: Principles of Water Balance—Dr. Weston M. Kelsey, Winston-Salem; ACTH and Cortisone—Dr. Ernest Yount, Winston-Salem; Certain Surgical Procedures in the Treatment of Chronic Poliomyelitis—Dr. George R. Miller, Gastonia; a clinicopathologic conference—Dr. John C. Reece, Morganton, and Dr. Millard Riggs, Drexel.

Newly elected officers for 1952 are Dr. William H. Kibler, president, succeeding Dr. J. H. Shuford; and Dr. E. W. Phifer, secretary-treasurer, succeeding Dr. J. S. Lewis. The society is scheduled to meet in Morganton, September, 1952.

News Notes

The new Gaston Memorial Hospital was formally dedicated on September 29, with the Honorable William B. Umstead, former United States senator, as the principal speaker. Mr. Umstead was introduced by the Honorable R. Gregg Cherry, former governor of North Carolina.

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Dr. W. J. Highsmith, Jr., has opened his office for the general practice of medicine at Hamilton, North Carolina.

* * *

Dr. Ira Ben Miller has announced the opening of his office at 517 Main Street, High Point, North Carolina. His practice will be limited to internal medicine.

Westbrook Sanatorium

The officers and staff of Westbrook Sanatorium, Richmond, Virginia, were host at a barbecue supper, in celebration of the fortieth anniversary of the institution, on Friday, October 5, 1951.

American College of Chest Physicians

The fourth annual postgraduate course sponsored by the Council on Postgraduate Medical Education and the New York State Chapter of the American College of Chest Physicians will be held at the Hotel New Yorker, New York City, November 12-17. Application should be made to the College at 112 East Chestnut Street, Chicago 11, Illinois.

American College of Chest Physicians Southern Chapter

The Southern Chapter of the American College of Chest Physicians will hold its eighth annual meeting at the Adolphus Hotel, Dallas, Texas, November 4-5. The chapter will meet jointly with the Southern Medical Association, whose annual meeting will be held November 5-8.

AMERICAN ACADEMY OF OBSTETRICS AND GYNECOLOGY

The National Federation of Obstetric-Gynecologic Societies has reconstituted itself as The American Academy of Obstetrics and Gynecology. This action was taken at the Federation meeting held on June 13, 1951, in Atlantic City in response to the long felt need for a national society for obstetricians and gynecologists based on individual and personal membership.

The following officers were elected at this meeting:

President—Woodard D. Beacham, New Orleans, Louisiana

President-Elect—Carl P. Huber, Indianapolis, Indiana

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The Academy was incorporated on August 4, 1951, as a non-profit corporation under the laws of the State of Illinois. Its objects are listed in the Constitution and By-Laws, which were adopted at a meeting held at Hot Springs, Virginia, on September 5, 1951. They include "fostering and stimulating interest in obstetrics and gynecology and all aspects of the work for the welfare of women which properly come within the scope of obstetrics and gynecology."

The first business meeting of the Academy will be held at the time of the meeting of the American Congress on Obstetrics and Gynecology in Cincinnati, March 31 through April 4, 1952. The first annual clinical meeting will be held in Chicago, Illinois, during the winter of 1952-1953.

Applications for Fellowship may be obtained from the Secretary's office, 116 South Michigan Avenue, Chicago 3, Illinois.

AMERICAN PUBLIC HEALTH ASSOCIATION

The technical and scientific knowledge that makes our country one of the healthiest among nations will be highlighted when the American Public Health Association holds its seventy-ninth annual meeting in San Francisco, October 29 to November 2, Dr. Reginald M. Atwater, Executive Secretary of the Association, has announced.

The eighteenth annual meeting of the Western Branch of the Association and the annual meetings of thirty-eight related organizations will be held at the same time. All meetings will take place in the Civic Auditorium and the Palace and Whitcomb Hotels in San Francisco.

The American Public Health Association is the professional society of more than 12,000 men and women in public health work in the United States, Canada, Mexico, and Cuba. The annual meeting is the largest assembly in the world of public health workers. More than 400 speakers and discussants will participate in the sessions, workshops, and panel discussions.

AMERICAN COLLEGE OF SURGEONS

Twenty-six hospitals in San Francisco and East Bay communities and the medical schools of the University of California and Stanford University are planning clinics, demonstrations, postgraduate courses, and other events for the surgeons and hospital personnel who will attend the thirty-seventh Clinical Congress and the thirtieth Hospital Standardization Conference of the American College of Surgeons November 5 to 9 in San Francisco.

AMERICAN TRUDEAU SOCIETY

The American Trudeau Society, Medical Section of the National Tuberculosis Association, invites the submission of scientific and clinical titles for presentation at its next annual meeting, in Boston, week of May 26, 1952, at the Hotel Statler. Abstracts of titles for this 1952 meeting, or completed papers, must reach the chairman, Medical Sessions Committee, American Trudeau Society, 1790 Broadway, New York, New York, not later than January 1, 1952. Abstracts should be limited to 300 words, at the most.

All abstracts and papers will be reviewed by the committee for selection of the most interesting material. Papers not selected for reading on the program will be presented by title and read, if time permits. Subjects for presentation will include all clinical and scientific aspects of tuberculosis, nontuberculous respiratory and cardiac disease as well as the results of investigative work with some bearing upon these subjects.

NATIONAL SOCIETY FOR CRIPPLED CHILDREN AND ADULTS

The vital role of the crippled in the national defense effort shared the spotlight with advances in the treatment and training of crippled children at the annual convention of the National Society for Crippled Children and Adults, the Easter Seal Agency, in Chicago's Palmer House, October 3-5.

Nationally known authorities in both fields were featured speakers on a program which marked the National Society's thirtieth year of service to the crippled. Dr. Theodore G. Klumpp, president of the New York chemical firm of Winthrop-Stearns, Inc., and chairman of the President's newly formed Task Force to mobilize the handicapped for defense employment, spoke on the role of industry and management in employment of the crippled. An actual clinic demonstration of handicapped workers in industry was conducted by Dr. George G. Deaver, past president of the American Academy for Cerebral Palsy, and professor of physical medicine and rehabilitation, New York University College of Medicine. Mary Switzer, director of the United States Office of Vocational Rehabilitation, Washington, D. C., and Henry Viscardi, executive director of "Just One Break for the Disabled" committee, New York University—Bellevue Medical Center, described the role that volunteer agencies can play in defense mobilization.

A special feature of the convention was a series of professional seminars covering the subjects of diagnosis of cerebral palsy in the young adult, daily living activities for the crippled child, physical therapy, occupational therapy, speech therapy, social and emotional problems, and special education. Among the participants was Edna M. Blumenthal, director of rehabilitation, North Carolina Hospital for Cerebral Palsy, Durham.

National Foundation for Infantile Paralysis

The National Foundation for Infantile Paralysis announces the availability of a limited number of additional postdoctoral fellowships to candidates whose interests are research and teaching in medicine and the related biological and physical sciences. The purpose of these National Foundation fellowships is to increase the number of professional workers qualified to give leadership in the solution of basic and clinical research problems of poliomyelitis and other crippling diseases.

The fellowships cover a period of from one to five years. Stipends range from $3,600 to $7,000 a year, with marital and dependency status considered in determining individual awards. Institutions which accept Fellows receive additional compensation for expenses incurred in relation to their training programs.

Eligibility requirements include United States citizenship (or the declared intention of becoming a citizen), sound health and an M.D., Ph.D., or an equivalent degree.

Complete information concerning qualifications and applications may be obtained from: Division of Professional Education, The National Foundation for Infantile Paralysis, 120 Broadway, New York 5, New York.

American Diabetes Association

The high cost of meats need not force people to cut down the amount of protein they eat, since less expensive but equally nutritious meat substitutes are easily available, according to an article in the September issue of the A.D.A. **Forecast,** America's only national magazine for people who have diabetes.

Written by the **Forecast's** dietary expert, Deaconess Maude Behrman of Philadelphia's Lankenau Hospital, the article presents a list of protein-rich foods other than meat, and gives the quantities in which one equals one ounce of meat in protein value. A quarter of a cup of cottage cheese, for example, equals an ounce of beef, lamb, or pork. Other substitutes listed run the gamut from oysters to eggs, from peanut butter to sardines.

Deaconess Behrman points out that for diabetics, to whom any reduction in protein intake could easily cause trouble, the small cans of diced meats for babies provide excellent single-person portions of protein. They should be particularly useful for diabetics living alone, and for those in families who use non-protein meat substitutes. The A.D.A. **Forecast,** in which Deaconess Behrman's article appears, is a bimonthly magazine published in the interest of diabetics everywhere by the American Diabetes Association, Inc., at 11 West 42nd Street, New York 18, New York. First published in 1948, it has by now a circulation of nearly 20,000 readers.

American Medical Writers' Association

Dr. Lewis J. Moorman of Oklahoma City, secretary of the Oklahoma State Medical Association, editor of the Journal of the Oklahoma State Medical Association, and former Dean and Professor of Medicine, University of Oklahoma School of Medicine, was elected president-elect of the American Medical Writers' Association at the eighth annual meeting held in Peoria, Illinois, on September 19. The other officers elected were Dr. Jacob E. Reisch of Springfield, Illinois, first vice president; Dr. J. Spencer Felton of Oak Ridge, Tennessee, second vice president; Dr. Harold Swanberg of Quincy, Illinois, secretary-treasurer (re-elected); Dr. Lee D. Van Antwerp of Chicago, editor; Dr. Norbert C. Barwasser of Moline, Illinois, accounting officer. Those elected members of the Board of Directors were: Dr. John R. Miner, Rochester, Minnesota; Dr. Wallace Marshall, Two Rivers, Wisconsin; Dr. Everett M. George, Des Moines, Iowa; Dr. Norris J. Heckel, Chicago; Dr. Theodore R. Van Dellen, Chicago; Dr. C. W. Schumacher, St. Louis; Dr. M. Pierce Rucker, Richmond, Virginia; and Miss Helen Penn, St. Louis.

The papers read at the Peoria meeting will be published in the January 1952 issue of the **Mississippi Valley Medical Journal** (Quincy, Illinois). Further details of the Association may be secured from the Secretary, Harold Swanberg, M.D., 209-224 W.C.U. Bldg., Quincy, Illinois.

Mississippi Valley Medical Society

Dr. Grayson L. Carroll, nationally known urologist and teacher of St. Louis University School of Medicine, has been honored by the Mississippi Valley Medical Society as its Distinguished Service Award Recipient for 1951. The award, consisting of a gold medal and a certificate, was presented to Dr. Carroll at the banquet on the occasion of the sixteenth Annual Meeting of the Society at the Pere Marquette Hotel, Peoria, Illinois, September 20. Dr. Carroll is associate professor of urology, St. Louis University, head of the department of Urology at St. Louis City Hospital, and was president of the Mississippi Valley Medical Society in 1946.

Mississippi Valley Medical Journal

The November issue of the **Mississippi Valley Medical Journal & Radiologic Review** (Quincy, Illinois), is the fourth annual "Radiation Therapy" number of that publication. This special issue is limited to original, practical papers on radiation therapy contributed by leading specialists. All the papers have been especially written for this number and are designed to appeal to physicians in the general practice of medicine and surgery.

Department of the Army

Walter Reed Centennial Observed Throughout Nation

The centenary of the birth of Major Walter Reed was marked throughout the country September 13 in observances recalling the great physician's successful struggle to determine the mode of transmission of yellow fever. On the same day the showplace of American military medicine and research, formerly known as the Army Medical Center, Washington, D. C., was officially renamed the Walter Reed Army Medical Center.

In Washington September 13 was designated Walter Reed Day by the District of Columbia Board of Commissioners in a ceremony attended by Major General Walter Reed, son of Major Reed and former Inspector General of the Army. The Army Medical Museum simultaneously presented a special exhibit depicting Major Reed's work, and the Medical Center held open house in his honor.

The New York University College of Medicine, from which Major Reed received his second medical degree in 1870, also exhibited relics of his experiments in a public display at 477 First Avenue, New York.

At Major Reed's birthplace at Belroi, Virginia, Brigadier General Earle Standlee, Surgeon of Army Field Forces, Fort Monroe, Virginia, read a message from General Streit to a large gathering, including hospitalized veterans from Korea, who participated in the ceremony sponsored by the Virginia Medical Society, the Gloucester County Junior Chamber of Commerce and the Medical Center. At Harrisonburg,

Virginia, Colonel Joseph U. Weaver, deputy commander of the Medical Center, led a parade from the former Reed homestead at Stoneleigh, now a Veterans Memorial Home, to Walter Reed Hall on the campus of Madison College where he spoke briefly.

The Board of Supervisors of Gloucester, Virginia, near Belroi, also declared the thirteenth Walter Reed Day, and supervised a commemorative program of speeches and a concert by the Army band from Fort Monroe, Virginia. Murfreesboro, North Carolina, birthplace of Major Reed's wife, was another town to proclaim a Walter Reed Day.

VETERANS ADMINISTRATION

Veterans Administration recently announced that approximately 5,000 employees had been dropped from the agency's payroll by October 10, 1951, because of budget limitations contained in V-A's appropriation for the 1952 fiscal year. The appropriation measure, covering the period from July 1, 1951, to June 30, 1952, inclusive, was signed by the President August 31.

The reduction will be nationwide, and will include all administrative activities of V-A. Excluded from the cut are Department of Medicine and Surgery personnel who staff the V-A's 151 veterans hospitals throughout the country.

FEDERAL SECURITY AGENCY

Public Health Service

Death rates in the United States for several important diseases—including acute poliomyelitis, tuberculosis, and measles—fell significantly in 1950 as compared with 1949.

The death rate for acute poliomyelitis, per 100,000 population, fell off by 39 per cent in 1950. In actual numbers there were 2,720 polio deaths in 1949, and 1,690 estimated for 1950. This is believed to parallel a drop in cases reported in 1950 compared with 1949. The tuberculosis death rate dropped 16 per cent, for an estimated decrease of 5,470 deaths. The death rate for measles was cut in half, coinciding with a decline in the number of cases of measles in 1950.

Other important causes of death with decreases in death rates were gastritis and some intestinal diseases, cirrhosis of the liver, complications of pregnancy, and homicide. The maternal death rate, per 10,000 live births, dropped from 9.0 in 1949 to an estimated rate of 7.2 in 1950, a record low.

Death rates for influenza and pneumonia for 1950 increased slightly over 1949, probably as a result of the influenza epidemic during the late winter and early spring months of 1950. The death rate for diseases of the heart also increased slightly, while the rate for cancer remained at about the same level in both years.

* * *

The nation's defenses against outbreaks of epidemic diseases have been strengthened by the establishment of an Epidemic Intelligence Service in the Public Health Service, it was announced recently.

Twenty-one new Public Health Service medical officers have recently completed an intensive eight week training course in Atlanta, Georgia, headquarters of the Communicable Disease Center. They have been assigned posts in the newly organized service and have taken up their stations in twelve states this month.

* * *

Appointment of Dr. Pearce Bailey as Director of the National Institute of Neurological Diseases and Blindness has been announced by Dr. W. Palmer Dearing, acting Surgeon General of the Public Health Service.

Dr. Bailey will be the first director of this Institute, which was established by an Act of Congress last summer as one of the National Institutes of Health. Dr. Bailey assumed his new post on October 3, 1951.

Dr. Bailey is president of the American Academy of Neurology, which he was instrumental in founding in 1948. He is a member of many other medical societies, including the American Neurological Association, the author of many papers, and served as United States Delegate to the International Poliomyelitis Congress, New York, 1948, and to the Fourth International Neurological Congress, Paris, 1949.

* * *

Over 800 cases of malaria among military personnel returning from Korea have been reported by state health authorities in recent weeks, Dr. Leonard A. Scheele, Surgeon General of the Public Health Service, said recently.

"Seven states alone reported over 600 new cases in a single month—July—and most of these were contracted outside the United States," said Dr. Scheele. The seven states are: Arkansas, 38; Colorado, 65; Georgia, 237; Kentucky, 97; Oklahoma, 101; Oregon, 29; and Wisconsin, 60. Total: 627.

Dr. Scheele said it is difficult to determine precisely the number of service-connected cases because reports from some states do not distinguish between military and non-military cases, or between those acquired in this country and abroad.

"Despite the lack of complete data, reports to date emphasize the need for effective control measures," Dr. Scheele pointed out.

The Surgeon General pointed out that whereas provisional figures in the National Office of Vital Statistics for the month of July show a total of 842 cases, the total for all states for the first six months of 1951 is 737.

Isolation of Encephalitis Virus

Researchers of the Communicable Disease Center, Public Health Service, have isolated the virus of encephalitis from wild birds under natural conditions, it was announced recently by Leonard A. Scheele, Surgeon General of the Public Health Service, Federal Security Agency.

It has been suspected for many years that birds harbor the virus, but this is the first time that their role definitely has been proven, according to Dr. T. Aidan Cockburn, epidemiologist in charge of encephalitis studies, office of Midwestern CDC Services, Kansas City, Kansas.

The encephalitis unit at Greeley, Colorado, under Dr. Cockburn's direction, has reported the isolation of virus twice from redwing blackbirds and once from magpies. The virus, which is a type known as Western equine, also was recovered from two batches of mosquitoes and one batch of mites, for a total of six isolations, all from Weld County, of which Greeley is the county seat. The laboratory work was performed by the CDC virus and rickettsia laboratory at Montgomery, Alabama.

Man and horses are infected with the virus after being bitten by certain species of mosquitoes, according to Dr. Cockburn. Mites, lice, and ticks also become infested, adding to the complications involved in studying the disease. Wild birds, now proven to harbor the virus, do not become "sick," but act only as carriers, from which mosquitoes can acquire the virus.

According to Public Health Service figures, the incidence of encephalitis in the United States increased in 1950 for the second consecutive year. Dr. Cockburn said that the increase possibly was due to better recognition of the disease.

In 1948 there were 575 reported cases; in 1949, 781 cases; and in 1950, 1,051 cases. Many thousands more are believed to have gone unrecognized, or to have been erroneously diagnosed as poliomyelitis.

Successful use of an artificial heart and lungs to tide over circulation of blood in patients undergoing critical heart and general chest surgery can be expected in the near future, possibly within a year, scientists attending a symposium on artificial heart-lung machines predict. The symposium was held at the National Institutes of Health, Public Health Service.

The prediction highlights a report on the symposium made by its chairman, Doctor Frederick A. Coller, Chief of the Department of Surgery at the University of Michigan, Ann Arbor.

* * *

Thirty-eight administrators of federal hospitals will attend the fourth Inter-Agency Institute for Hospital Administrators which will be held at the Federal Security Agency, Washington, D. C., for a three week period beginning October 29, 1951, Dr. Leonard A. Scheele, Surgeon General of the Public Health Service has announced.

New Way Used in Korea to Cleanse G.I.'s Wounds

A new method for rapid cleansing of wounds under battlefield conditions is proving of "great use in the field," the commander of a medical unit at the Korean front has reported.

He is a major in the Medical Corps and battalion surgeon to a combat engineer team of 500 men. For security reasons, his name and unit were not disclosed.

The surgeon said the method also is bringing relief to G.I.'s from such skin infections as folliculitis, complicated by infrequent changes of clothing.

As reported, the method employs for the first time in the field a germ-killing soapless detergent widely used by surgeons in American hospitals as a pre-operative scrub.

The technique was revealed in communications received here by Dr. B. Thurber Guild, associate medical director of Winthrop-Stearns, Inc., which developed the detergent, called pHisoHex

Originally developed for operating teams in hospitals, where it has cut scrub time from ten to two minutes, pHisoHex is widely prescribed by dermatologists for patients who cannot use soap without ill effects. It is also used by nurses to prevent cross-infections in nurseries.

The new squeeze bottle was introduced for visiting nurses' and doctors' emergency bags. It is unbreakable and dispenses economically in drops.

pHisoHex is said to cleanse more rapidly and with greater thoroughness than soap, and unlike soap, is equally effective in hard or even sea water. Suds are developed by adding repeated small amounts of water, with gentle rubbing, after the hands have been spread with the detergent.

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AUXILIARY

PUBLIC RELATIONS PROGRAM

In April of 1923, when Mrs. Paul Priestly McCain organized the Auxiliary to the Medical Society of the State of North Carolina, our by-laws read as follows:

"Section I—The objects of this organization shall be to interpret the aims of the medical profession to other organizations interested in the promotion of health education; to assist in the entertainment at the meetings of the Medical Society of the State of North Carolina; to promote friendliness among the families of the medical profession; and to do such work as may from time to time be approved by the Advisory Committee appointed by the Executive Committee of the Medical Society of the State of North Carolina."

Our chief purpose in being organized at that time was to add a social side to the Medical Society meetings and, by giving the wives a part in the program, to attract more doctors to the scientific meetings. We were being used to sweeten the medicine, shall we say. We still consider this an important part of our function—but we have matured since those days. The doctors who helped to draw up our constitution had realized our potentialities when they wrote "and to do such work as may from time to time be approved by the Advisory Board" . . . etc. This gave them leaway to enlarge the scope of our endeavors.

This year the Advisory Board of the Medical Society of the State of North Carolina is composed of Dr. Rachel Davis of Kinston, chairman, Dr. Raney Stanford of Durham, and Dr. Olivia Abernathy of Elkin. This very able committee took time from their busy lives to meet in Durham and talk over the projects we shall undertake as our program for 1951-1952. They made suggestions and, with the aid of Mr. Leroy Cox, public relations director for the Medical Society, and Mr. James T. Barnes, executive secretary of the Medical Society, gave us a public relations program. We are giving you this program, in a condensed form, because we believe that doctors are interested in knowing what we are doing, and because we hope that members-at-large in the Auxiliary will read this page and be inspired to help their district councilor in organizing an active auxiliary in their communities. What better task could we set our hand to than furthering the profession of our husbands?

Suggested Public Relations Program

1. Form educational contacts and disseminate information and literature to all overlapping womens' organizations (P.T.A., A.A.U.W., etc.).
2. Distribute educational literature in doctors' offices, hospitals, hotels, beauty shops, schools, public and semi-public libraries, and meeting quarters of overlapping organizations.
3. Promote nurse recruitment, Student Loan Fund, and scholarships.
4. Promote "Health Day."
5. Promote the organization of county health councils under Rural Health.
6. Establish speakers' bureaus in each county, inform public of these bureaus and available speakers. Speakers should be Auxiliary members or informed people of proper concepts from without Auxiliary.
7. Sponsor Fair booths for education on health, medicine, and nurse recruitment.
8. Use audio-visual aids in health education; *i.e.*, radio, television, and motion pictures.
9. Obtain wider distribution of the Auxiliary *News Letter* and place a copy in the hands of every member and prospective member.
10. Promote and assist the passage of proper legislation — positive with emphasis; negative with reserve.
11. Assist in the care of the aged, blind, and disabled by visits and donations.
12. Join and be active in the local hospital guild. This is an excellent way to promote good public education and public relations.
13. Do volunteer work in your hospital.
14. Continue to procure resolutions against socialized medicine and send them to the proper persons. Every member should write and get one other person to write to her congressman and senator once a year, telling them she is against socialization of medicine or any other proposed step which is against our American way of life. Be conscious of the fact that socialization of medicine will be a plank in the 1952 Democratic platform. VOTE.
15. Interest prominent laymen and women in your local auxiliaries, and enlist them in your speakers' bureaus.
16. Encourage all members of the Auxiliary to be joiners and doers in all worthwhile community organizations.
17. Promote the sale of *Today's Health*—a medium of education to the laymen.
18. Participate in Civil Defense organizations and practices.
19. Volunteer aid in health centers, such as cancer detection centers, heart centers, and the like.
20. Conduct educational inspection tours of local medical health services.
21. Educate yourself as to the essential doctor-hospital, doctor-nurse, doctor-patient, and doctor-public relations.
22. Promote good will and essential discipline within and among doctor families in order to develop public grace.

A word from Mr. Cox: "Believing as I do that the Auxiliary is potentially the physicians' best source of good public relations, good work should always be the corner stone of operation for each Auxiliary."

As you can readily see, the above is an extremely comprehensive program. There is a tremendous opportunity for each and every one of us. I urge all of you from the bottom of my heart to study this and set your minds to the task which confronts us all.

MRS. B. W. ROBERTS, *President*

Classified Advertisements

Surgeon—age 32; Tar Heel; veteran, category IV: qualified for Boards; desires association with individual, group or opportunity for private practice of surgery. Reply J 17—Box 790, Raleigh, N. C.

Physician 40, Southern Protestant, Category IV, GP experience 10 Surgery USA 4½, desires permanent General Surgical or group association in city ten to fifty thousand with public hospital. Excellent references, early availability. Reply Palmeto Box 790, Raleigh, N. C.

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In long standing EENT practice. $7,500 net first year, full partnership second year. In town of 28,000 population. Practice enough for two and opportunity to increase. Reply WLS, Box 1606, Raleigh, North Carolina.

BOOK REVIEWS

Practical Haematology. By J. V. Dacie, Department of Pathology, Postgraduate Medical School of London. 172 pages, illustrated. Price, $3.40. New York: Chemical Publishing Company, 1950.

If one does not read Dr. Dacie's preface he may be led to make unjustified remarks about this slender volume. Its author is a well known British hematologist whose work on hemolytic anemias has received particular attention. He states that the book is an outgrowth of notes prepared for a one year course in hematologic techniques and interpretation given to applicants for a London University Diploma in Clinical Pathology. Subjects seeming to belong to morphology or medicine have been omitted, and no comprehensive review of methods is attempted. The methods described, often only one for each determination, are those used by Dr. Dacie in his daily work.

The reviewer objects to the use of so pragmatic a term as "practical" in the title of this book. The measurement of red cell diameters, which may be quite practical for Dr. Dacie, is not a practical determination for 95 per cent of his readers and yet a chapter is devoted to this subject. An outstanding feature of the book is the excellent discussion of the errors inherent in the various determinations; yet the author is occasionally uncritical in his choice of a determination, which is as much an offense to statistics as reporting a red count to too many figures. For instance, while dismissing the measurement of clot retraction as of minor practical importance, he gives a quantitative method for its determination which hardly any laboratory will wish to use, and he does not mention the usual simple technique of doing it. For these reasons, as well as such minutiae as using waxed Pastuer pipettes, a suggestion which will cause any technician to rapidly turn the page, the book cannot be recommended to one group the author aimed for, the average laboratory technician.

For the experienced laboratory worker in hematology, be he physician or technician, with sufficient background to contrast Dr. Dacie's methods with the others in use, this book will be a real pleasure to read and an occasional source of methods. Persons in this category will appreciate the insight Dr. Dacie has into the foibles of laboratory workers and those who use the laboratory, and will appreciate his evaluation of methods he has obviously used and not merely read about. For these people the book cannot be too highly recommended. It is not, however, for those who are instantly attracted by the "practical" in the title.

Physical Examination in Health and Disease. By Rudolph H. Kampeier, M.D. 820 pages, with 550 illustrations. Price, $8.00. Philadelphia: F. A. Davis Company, 1950.

The author has justified the publication of another textbook of physical diagnosis as an attempt to "give the reason—anatomic, physiologic, or pathologic and for physical manifestations when the cause is not obvious," and has altered his presentation of the material from that of the usual text by alternating between consecutive chapters the technique of examination and a description of the normal with that of the abnormal findings which may be encountered. The abnormal findings are then related to the pathologic change.

The book is designed primarily for the second year student of physical diagnosis rather than more advanced students or physicians, and, to this end, it serves its purpose well. The text is well printed, contains an adequate number of excellent illustrations, and is marked by an unusual facility of presentation, which will make it of value to the student of medicine for whom it is designed.

Practical Clinical Psychiatry. By Edward A. Strecker, M.D., Professor of Psychiatry, School of Medicine, University of Pennsylvania; Franklin G. Ebaugh, M.D., Professor of Psychiatry, University of Colorado, School of Medicine and Director, Colorado Psychopathic Hospital; and Jack R. Ewalt, M.D., Professor of Neuropsychiatry and Administrator of Hospitals, University of Texas Medical Branch, Galveston. Ed. 2. 506 pages. Price, $7.00. Philadelphia: The Blakiston Company, 1951.

As stated in the preface to the seventh edition of this textbook on psychiatry, it is aimed, not only at the student and practitioner in psychiatry, but at the general practitioner and the other specialists in the field of medicine as well. The authors recognize the great need in the world today for psychiatric understanding and realize that there probably never will be enough fully trained psychiatric specialists to fill the need. So it devolves upon the medical profession generally to do what they can to understand and deal with the psychic as well as somatic aspects of medicine in the treatment of their patients. This textbook represents the culmination of many years of effort in bringing together the essential material for a proper background and understanding of psychiatry, and presents it in such a simple and direct form as to be understandable and helpful to all who are interested in the service of their fellow man. This seventh edition brings this work up to date.

There are two notable additions in this edition. First, a very excellent summary of what is now known and generally accepted of psychopathology has been included in the first chapter on "Personality Development and Function." It is so readable and simply expressed that even those who have had little or no training in this field can follow and understand. Second, a whole chapter, number thirteen, has been devoted to what the authors call "support" psychotherapy, some of which, in very brief form, had been included in the therapy section of the chapter on the psychoneuroses in earlier editions. This is perhaps the most outstanding contribution in this seventh edition. It serves well the purpose for which it is intended, as a practical guide to all physicians in examining their attitudes and capabilities and in making a sound, workable approach to psychotherapy. There are many valuable suggestions regarding the approach to the patient and his problem, and methods of helping the patient to grow in understanding of himself and his illness. It takes much of the mystery out of the term psychotherapy and brings some of the methods within the scope of the general physician, thus increasing his effectiveness.

There are other changes. The book has been thoroughly revised. The classification is brought right up to the present—a dynamic approach to this problem, with every effort made to avoid a static, stereotyped nosology. New case material has been added, and the text has been altered in many places to conform to present day investigation and thinking. The unnecessarily detailed descriptions of the older, mostly outdated, methods of treatment of neurosyphilis, for example, have been deleted from this edition. As a painstaking and thorough revision of an excellent work, this seventh edition is a testimony in itself.

Parasitic Infections In Man. Edited by Harry Most, M.D. 229 pages. Price, $4.50. New York: Columbia University Press, 1951.

In May, 1947, the Fellowship of the New York Academy of Medicine approved the organization of the Section on Microbiology. This Section is primarily concerned with bacteriology, mycology, parasitology, immunology, chemotherapy, diseases of obscure etiology which are possibly of infectious origin, and pathology related to microbiology.

This book is a collection of papers by fourteen outstanding workers in the field of parasitology presented at the Fourth Symposium of Microbiology sponsored by the New York Academy of Medicine. The papers have been edited by Dr. Harry Most, professor of preventive medicine at the New York University—Bellevue Medical Center.

The first paper is by Paul F. Russell, and deals with the importance of parasitic diseases in world health.

The second paper, by Clay G. Huff, is concerned with the significance of the new findings in the life cycle of the malarial parasite.

The third and fourth papers, by James T. Culbertson and John Bozicevich, respectively, deal with immunology and immunologic diagnosis of parasitic infections.

In the fifth paper, Norman R. Stoll discusses the problem of diagnosis of intestinal parasites.

The physiology and metabolism of various protozoa and helminths are discussed in the next five papers.

The last four papers are probably of the greatest general interest, for they are a review of the therapeutic agents used in the treatment of amebiasis, malaria, filariasis, intestinal helminthic infections, and schistosomiasis.

The title of the book is somewhat misleading, for it suggests a textbook of clinical parasitology, which it definitely is not. Actually, the book is a summary of current perspectives relating to the physiology of some of the animal parasites and to the diagnosis and treatment of various parasitic infections.

Papain. By M. L. Tainter, C. E. Alford, A. Arnold H. Blumberg, O. H. Buchanan, E. T. Hinkel, Jr., K. Hwange, A. C. Ivy, R. K. Lager, J. R. Schmitz, J. R. Shepherd, J. S. Wyzen and C. Zippin. 154 pages, illustrated. Price, $3.00. New York: The New York Academy of Sciences, 1951.

This small paper bound volume is a summary of the current status of the knowledge on papain, a product prepared from the milk of the green papaya—a tropical fruit. The substance is of interest since papain is a proteolytic enzyme which is remarkably thermostabile. It has been used in industry.

The natives of the tropics use crude papain both for its digesting action on food proteins—as in the tenderizing of meat—and for its local action on exudates such as the crust on infected burns. A series of ten articles by various authors describes methods for measuring the proteolytic activity and the effect of various factors such as temperature, drying, and the addition of chemicals on the activity of the enzymes.

Emotional Factors in Cardiovascular Disease. By Edward Weiss, M.D. Professor of Clinical Medicine, Temple University School of Medicine. 84 pages. Price, $2.25. Springfield, Illinois: Charles C. Thomas Company, 1951.

This monograph by one of the foremost authorities on psychosomatic medicine sums up admirably our present concepts of the subject. After two brief introductory chapters, Dr. Weiss discusses "functional" heart disease, the so-called neurocirculatory asthenia; hypertension and anxiety, and anxiety and organic heart disease. Hypotension is dismissed with a chapter of less than two pages, and psychosis in heart disease with a single paragraph.

This little book is well written. It gives the essence of the subjects under discussion without any "padding," and is well worth a careful reading in its entirety. Its beautiful format, together with the author's clear style, make reading it a pleasure.

Spatial Vector Electrocardiography. By Robert P. Grant, M.D., and E. Harvey Estes, Jr., M.D. 149 pages. Price, $4.50. Philadelphia: The Blakiston Company, 1951.

This compact volume explains the theory of vector interpretation, the relationship of vector calculation to the limb and precordial leads, and the loop pattern followed by the vector in the course of the generation of the QRS and T deflections in the electrocardiogram. The characteristics of the spatial vectors in the normal subject and in various abnormalities are discussed.

One objection which the reviewer has to the vector method is that, in essence, it assumes the heart to be located in a relatively homogeneous conductor. This reviewer believes, on the contrary, that the extremities and the chest leads act as if they were seeing or "making contact" with relatively small areas of the heart. However, this does not vitiate the conclusions which are arrived at by empirical correlation between the observed vectors and the actual clinical postmortem findings in the hearts.

The book is written so as to be readily understandable and may be of assistance to the physician and medical student in the understanding of electrocardiography.

Friend of the People: The Life of Dr. Peter Fayssoux. By Chalmers G. Davidson, M.D., 151 pages. Price, $2.75. Columbia, South Carolina: The Medical Association of South Carolina, 1950.

This biography of the first president of the Medical Association of South Carolina is obviously the work of a trained historian, and the officers of the society demonstrate their wisdom in supporting Dr. Davidson's work, rather than entrusting the task to the often uncritical, partisan amateur. It is a rather short work, yet it includes a great deal of background material which serves to bring Dr. Fayssoux to life against the tumultuous society of pre- and post- Revolutionary South Carolina.

Fayssoux was a native American of Huguenot ancestry, educated in medicine at Edinburgh, who practiced in Charleston from 1769 until his death in 1795, with time out for various military campaigns. He was active during that entire period in the general affairs of Charleston, and his activities earn him a place, though a minor one, in that company of gifted amateurs which marked the political and scientific life of the eighteenth century. He took part in the organization of cultural, political, and professional societies, and was human enough to be expelled from the first of these for not paying his dues. While at Edinburgh he became a friend of Benjamin Rush, and his correspondence with that distinguished physician is frequently referred to. In describing Dr. Fayssoux's activities, Dr. Davidson also presents a view of the evolution of South Carolina politics from allegiance to Britain, through admission to the original thirteen states, and settling down to being a part of the Union.

The scholarship of Dr. Davidson's work is at-